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Foreword

Environmental Performance Reviews (EPRs) for countries in transition were initiated by Environment Ministers at the second Environment for Europe Ministerial Conference, held in Lucerne, Switzerland, in 1993. Subsequently, the United Nations Economic Commission for Europe (UNECE) Committee on Environmental Policy decided to make the EPRs part of its regular programme. The first cycle of reviews, of 23 countries from the UNECE region, began in 1994 and was carried out until 2004.

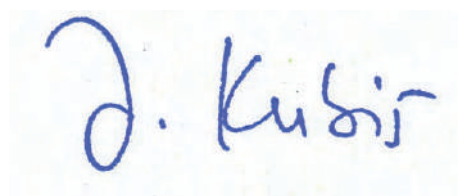
At the fifth Environment for Europe Ministerial Conference (Kiev, 2003), the Ministers affirmed their support for the EPR Programme, in particular as an important instrument for countries with economies in transition, and decided that the Programme should continue with a second cycle of reviews. This support was recently reconfirmed at the sixth Environment for Europe Ministerial Conference (Belgrade, 2007). This second cycle, while assessing the progress made since the first review process, puts particular emphasis on implementation, integration, financing and the socio-economic interface with the environment.

Through the peer review process, EPRs also promote dialogue among UNECE member States and the harmonization of environmental conditions and policies throughout the region. As a voluntary exercise, EPRs are undertaken only at the request of the countries concerned.

The studies are carried out by international teams of experts from the region, working closely with national experts from the reviewed country. The teams also benefit from close cooperation with other organizations in the United Nations system, for instance the United Nations Development Programme, as well as with the Organisation for Economic Co-operation and Development and other organizations.

This is the second EPR of Uzbekistan to be published by UNECE. The review takes stock of the progress made by Uzbekistan in the management of its environment since the country was first reviewed in 2001. It assesses the implementation of the recommendations contained in the first review (annex I). This second EPR also covers nine issues of importance to Uzbekistan related to policymaking, planning and implementation, the financing of environmental policies and projects, and the integration of environmental concerns into economic sectors, in particular the sustainable management and protection of water resources, land management, energy and climate change.

I hope that this second EPR will be useful in supporting policymakers and representatives of civil society in their efforts to improve environmental management and to further promote sustainable development in Uzbekistan, and that the lessons learned from the peer review process will also benefit other countries of the UNECE region.



Ján Kubiš
Executive Secretary
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Preface

The second Environmental Performance Review (EPR) of Uzbekistan began in February 2008 with a preparatory mission. During this mission, the final structure of the report was discussed and established. A review mission took place from 20 to 29 April 2009. The team of international experts taking part included experts from Finland, France, Germany, Kazakhstan and the United States of America, as well as from the secretariats of the United Nations Environment Programme (UNEP) and the United Nations Economic Commission for Europe (UNECE).

The draft EPR report and its translation into Russian were submitted to Uzbekistan for comment and to the Expert Group on Environmental Performance for consideration in September 2009. During its meeting on 19 October 2009, the Expert Group discussed the report in detail with expert representatives of the Government of Uzbekistan, focusing in particular on the conclusions and recommendations made by the international experts.

The EPR recommendations, with suggested amendments from the Expert Group, were then submitted for peer review to the sixteenth session of the UNECE Committee on Environmental Policy on 20 October 2009. A high-level delegation from Uzbekistan participated in the peer review. The Committee adopted the recommendations as set out in this report.

The Committee on Environmental Policy and the UNECE review team would like to thank the Government of Uzbekistan and its experts who worked with the international experts and contributed their knowledge and assistance. UNECE wishes the Government of Uzbekistan further success in carrying out the tasks involved in meeting its environmental objectives, including the implementation of the recommendations contained in this second review.

UNECE would also like to express its deep appreciation to the Governments of the Netherlands and Switzerland for their financial contributions; to the Governments of Finland and Germany for having delegated their experts for the review; and to UNEP and the United Nations Development Programme for their support of the EPR Programme and this review.



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The mission for the project took place from 20 to 29 April 2009. The peer review was held in Geneva on 20 October 2009. The ECE Committee on Environmental Policy adopted the recommendations set out in this document.

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LIST OF ABBREVIATIONS

ADB	Asian Development Bank
BAIS	Basin administrations of irrigation systems
bcm	Billion cubic metres
BOD	Biochemical oxygen demand
CACILM	Central Asian Countries Initiative for Land Management
CDM	Clean Development Mechanism
CEEC	Central and Eastern European Countries
CERs	Certified Emission Reductions
CFC	Chlorofluorocarbon
CHP	Combined heat and power plant
CIS	Commonwealth of Independent States
CPI	Consumer price index
DDT	Dichlorodiphenyltrichloroethane
Dekhkan	Small family farm
EBRD	European Bank for Reconstruction and Development
EECCA	Eastern Europe, Caucasus and Central Asia
EIA	Environmental impact assessment
EIS	Environmental Information System
EMEP	Cooperative Programme for Monitoring and Evaluation of the Long-range Transmission of Air Pollutants in Europe
EMS	Environmental management systems
EPR	Environmental Performance Review
ESCAP	Economic and Social Commission for Asia and the Pacific
ESD	Education for sustainable development
EU	European Union
EurAsEC	Eurasian Economic Community
FDI	Foreign direct investment
GDP	Gross domestic product
GEF	Global Environment Facility
GHG	Greenhouse gases
GOST	Former USSR standards organization
ICSD	Interstate Commission for Sustainable Development
ICWC	Interstate Commission for Water Coordination
IDB	Islamic Development Bank
IEC	International Electrotechnical Commission
IFAS	International Fund for Saving the Aral Sea
IPCC	Intergovernmental Panel on Climate Change
ISO	International Organization for Standardization
IWRM	Integrated water resources management
Khokim	Governor
Khokimiayt	Local authority
LUCF	Land-use change and forestry
MAC	Maximum allowable concentration
MDGs	United Nations Millennium Development Goals
MEA	Multilateral environmental agreement
NBSAP	National Biodiversity Strategy and Action Plan
NCCEC	National Council for the Coordination of Enforcement and Control
NEAP	National Environmental Action Plan
NGO	Non-governmental organization
NMMP	Navoi Mining and Metallurgy Plant

NUU	National University of Uzbekistan
NSDS	National Sustainable Development Strategy
ODS	Ozone-depleting substance
OECD	Organisation for Economic Co-operation and Development
Oliy Majlis	Parliament of Uzbekistan
OSCE	Organization for Security and Cooperation in Europe
PAH	Polycyclic aromatic hydrocarbons
PANP	Programme of Actions on Nature Protection
PEE	Public ecological expertise
POP	Persistent organic pollutant
PPI	Producer price index
PPP	Purchasing power parity
PRTR	Pollutant Release and Transfer Register
SCLR	State Committee on Land Resources, Geodesy, Cartography and State Cadastre
SCNP	State Committee for Nature Protection
SEA	Strategic environmental assessment
SEE	State ecological expertise
Shirkats	Large agricultural cooperatives
SSIAC	State Specialized Inspectorate for Analytical Control
TACIS	Technical Assistance to the Commonwealth of Independent States
toe	Ton of oil equivalent
TRACECA	Transport Corridor Europe-Caucasus-Asia
TSP	Total suspended particulates
UNCCD	United Nations Convention to Combat Desertification in Countries Experiencing Serious Drought and/or Desertification, Particularly in Africa
UNDP	United Nations Development Programme
UNECE	United Nations Economic Commission for Europe
UNEP	United Nations Environment Programme
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNFCCC	United Nations Framework Convention on Climate Change
UNIDO	United Nations Industrial Development Organization
USSR	Union of Soviet Socialist Republics
Uzbekneftegas	State oil company
Uzkommunkhizmat	Government agency responsible for communal services
Uzhydromet	Centre of Hydrometeorological Service
Uzstandard	Agency for Standardization, Metrology and Certification of Uzbekistan
VOC	Volatile organic compound
Vodokanal	Municipal water company
WGBU	German Advisory Council on Global Change
WHO	World Health Organization
WIS	Welfare Improvement Strategy
WPI	Water pollution index
WUA	Water user association
ZEF	Center for Development and Research

SIGNS AND MEASURES

..	not available
-	nil or negligible
.	decimal point
°C	degree Celcius
\$	dollar
Ci	Curie
GWh	gigawatt-hour
ha	hectare
kg	kilogram
kJ	kilojoule
km	kilometre
km ²	square kilometre
km ³	cubic kilometre
kgoe	kilogram of oil equivalent
ktoe	kiloton of oil equivalent
kV	kilovolt
kW	kilowatt
kWh	kilowatt-hour
l	litre
m	metre
m ²	square metre
m ³	cubic metre
MW	megawatt
PJ	petajoule
ppm	parts per million
s	second
t	ton
TJ	Terajoule
toe	ton of oil equivalent
tofe	ton of fuel equivalent
TWh	terawatt-hour

CURRENCY CONVERSION TABLE**Exchange rates (period average)**

Year	Sum / US\$
2000	236.58
2001	423.08
2002	771.42
2003	971.35
2004	1,019.94
2005	1,113.89
2006	1,219.59
2007	1,264.07
2008	1,320.94

Source: ECE database (accessed on 29 April 2009).

EXECUTIVE SUMMARY

The first Environmental Performance Review (EPR) of Uzbekistan was carried out in 2001. This second review intends to measure the progress made by Uzbekistan in managing its environment since the first EPR, and in addressing upcoming environmental challenges.

Since 2001, Uzbekistan has moved through significant periods of economic development and privatization. Economic growth results have been impressive, and since 2002, gross domestic product (GDP) has more than doubled. Although the poverty gap has been reduced to some extent, much more needs to be done, particularly in rural areas. Between 2001 and 2005, the difference between the poverty rate in urban and rural areas grew from 8 per cent to almost 12 per cent.

Despite its rich and varied natural environment, Uzbekistan became the centre of several serious environmental crises caused by environmental neglect combined with environmentally unfriendly economic policies. The large-scale use of chemicals for cotton cultivation, inefficient irrigation and poor drainage systems have led to a high filtration rate of contaminated and salinized water back into the soil. As a result, the freshwater supply has received further contaminants. Almost 50 per cent of all irrigated land is classified as saline, and about 5 per cent of irrigated land is severely saline.

The abstraction of huge amounts of water for irrigation purposes from the two main rivers in the region, the widespread use of agrochemicals and the insufficient treatment of wastewater are causing health and environmental problems on a significant scale. In 2007, the Aral Sea covered only 10 per cent of its original size. Uzbekistan has shifted its attention away from restoring the Aral Sea and towards creating a series of lakes to its south in order to gain microclimate benefits, and to combat erosion, desertification, deforestation and the loss of biodiversity.

The decision-making framework and its implementation

Uzbekistan upholds sustainable development as a priority. The 1997 National Sustainable Development Strategy (NSDS) continues to serve as the overarching framework for sustainable development and functions as the basic reference document for all strategies and legislation. All governmental documents must be consistent with the Strategy.

Overall, little attention is given to the environment in the Strategy, which is essentially a statement of principles to guide development in all sectors in the country. Most of the Strategy is dedicated to economic and social issues, with the general emphasis being on expanding growth and reducing poverty. Along with the NSDS, the National Environmental Action Plan, the National Environmental Health Action Plan and the National Biodiversity Strategy and Action Plan continue to be the basic strategies for sustainable development and environment protection. The 2007 Welfare Improvement Strategy for 2008–2010 focuses on harnessing the accelerated growth to reduce poverty in the country.

Since 2001, Uzbekistan has been developing new and amended environment-related laws in order to provide implementation measures for basic normative laws, to address issues previously neglected and to enable legislation to be consistent with relevant international laws and standards. Although the regulatory framework is also being developed, it is not unusual for the regulations required for implementation to lag behind the enactment of the law.

Compliance and enforcement mechanisms

State control by the competent public authorities, self-monitoring by enterprises and monitoring by citizens are the main mechanisms used to bring enterprises and individuals into compliance with the requirements of environmental laws. Since 2001, the above mechanisms, as well as the relevant provisions of the environmental and natural resources laws, have not been amended significantly.

Certain amendments to the environmental laws were introduced with the aim of reducing the administrative burden of the business community by limiting the power of environmental enforcement authorities to suspend or cease activities, except in certain cases, for example, imminent or potential threats to human health or the environment. Moreover, the Cabinet of Ministers approved a number of regulations that give limited responsibilities in some spheres of environmental enforcement to different ministries, committees and agencies.

While in the early 2000s the state ecological expertise (SEE) procedures were annually conducted on less than 5,000 facilities, in 2007 and 2008 they were conducted on approximately 12,000 facilities. The strategic environmental assessment instrument is not promoted in Uzbekistan. However, an SEE is mandatory for draft state programmes and concepts as well as town planning documentation at the design stage of facilities for a population size of over 50,000 people. For planned activities that are subjected to an SEE, a positive opinion given in the environmental impact assessment (EIA) report is the equivalent of an environmental permit.

The list of facilities subject to EIA and their division into four categories are not compatible with similar lists of projects subject to EIA under the European Union Directive on the assessment of the effects of certain public and private projects on the environment or the Convention on Environmental Impact Assessment in a Transboundary Context. Public hearings as part of the EIA procedure have been referred to the discretionary power of the SEE authority and the developer.

Environmental monitoring, information, public participation and education

The monitoring networks have not been enlarged, and in some areas have even been reduced since 2001. There is a need to strengthen environmental monitoring to make it an effective information and policy tool, to promote public participation in decision-making and to introduce the sustainable development principle into education and training at various levels.

The monitoring system does not meet the requirements of national monitoring regulations. Most environmental quality standards are still basically the same quality standards that were used during the Soviet period, while some of those related to ambient air have been reconsidered. In practice, a large number of pollutants that are covered by emission standards are not actually monitored by facilities.

The system of standards remains comprehensive, but overambitious. An excessively large number of regulated pollutants imposes unrealistic monitoring and enforcement requirements on the public authorities. Since a number of Uzbek standards are below the detection and calculation thresholds, it is impossible to know whether or not they are being implemented.

The pollution monitoring information system is well structured and provides data according to polluting parameters and individual enterprises. Once every two years, an information bulletin on the state of pollution sources and their environmental impact is published. The innovative feature of the bulletin is that it publishes exceedances in pollution levels by individual enterprises and compares them to the established limit values and relevant maximum allowable concentrations. This system of “naming and blaming” is unique among the countries that the United Nations Economic Commission for Europe (UNECE) has reviewed.

Important environmental issues are not covered by statistical data collection. The State Committee on Statistics continues to collect environment-related statistical data following the statistical forms that were introduced 20 to 30 years ago, practically without having made any changes.

Uzbekistan does not publish a regular statistics compendium on the environment. A limited number of environment-related data are published in the national Statistical Yearbook. The State Committee on Statistics produces an annual bulletin on the main indicators of environmental protection and the rational use of natural resources for restricted use by selected public authorities only. Many environmental data collected by the State Committee on Statistics are not available to the public.

However, the State Committee for Nature Protection (SCNP) has been actively disseminating environmental information to raise public awareness. It created a dedicated web portal and established the Chinar publishing house, which publishes the monthly Environmental Herald in Uzbek and Russian with supplements for children. Chinar also publishes many ad hoc environmental publications.

However, other authorities involved in environmental matters disseminate and popularize environmental information poorly. That would imply that Uzbek citizens are not sufficiently informed about environmental issues of concern such as the pollution of urban air, surface water, groundwater, soil and foodstuff, especially by pesticides.

Legislation does not support public participation in developing legal acts, regulations or programmes. Nonetheless, the SCNP involves members of the public in the discussion of such documents by inviting representatives of specialized non-governmental organizations to the meetings of its management board, but there is no subsequent feedback on whether or not the comments have been taken into account.

About half of the preschool institutions organize activities on environmental matters and sustainable development. Although primary schools cover environmental issues, secondary and high schools do not have the environment in their curricula. Few chairs on environmental issues or sustainable development exist at the university level.

International cooperation and commitments

Uzbekistan is a party to 24 multilateral environmental agreements (MEAs). However, their implementation could be more efficient. Although Uzbekistan has been regularly attending international meetings, the lack of national coordination effectively hampers the country's contribution to the favourable outcome of such intergovernmental forums. Furthermore, national reporting obligations under MEAs are not always adhered to in a timely and comprehensive manner.

Although Uzbekistan is positioning itself as a significant regional player, the country is a party to only one of five UNECE conventions. Owing to the transboundary nature of the conventions, there is uncertainty at the government level as to what accession would entail in practice.

Actual implementation of the Millennium Development Goals (MDGs) still requires further improvements. Following the 2000 United Nations Millennium Declaration, Uzbekistan formulated its own national targets and indicators. Although environmental sustainability is being incorporated in most development strategies and action plans, Uzbekistan can potentially achieve the MDG environmental sustainability targets. Progress, however, has been very slow, largely due to the lack of political will and commitment to institutionalize and effectively implement measures on environmental protection.

Located downstream in the Aral Sea internal drainage basin, Uzbekistan depends on transboundary waters from upstream countries. The scarcity of freshwater is currently, and will be in the future, the greatest environmental problem, since water is the key resource for irrigating low productivity saline lands for agricultural production. This situation calls for a new approach to the regulation of water management between sovereign States, highlighting the need to establish an adequate international legal framework for cooperation.

An important prerequisite for good neighbourly relations between countries is the assessment of the environmental impact of facilities and activities at an early phase of planning, including their cross-border impact. The Convention on Environmental Impact Assessment in a Transboundary Context and the Convention

on the Protection and Use of Transboundary Watercourses and International Lakes can provide an important legal basis for such dialogue and cooperation.

Economic instruments and environmental expenditures for environmental protection

The pollution charges regime has been stringent and environmental fund resources have increased. The increase in the rates of taxes on natural resources, while reducing profit tax rates, enabled Uzbekistan to make a shift towards green taxation. Tariffs have become more cost-reflective and the collection rate has increased. Environmental management, in particular spending on water supply and sanitation, is recognized as a priority in Uzbekistan.

No new financial instruments have been introduced since the last EPR. However, there have been changes to the rules that determine the calculation of payments under existing instruments, including privileges and the allocation of revenues at different territorial levels.

A number of users have benefited from special treatment regarding compensation payments for environmental pollution and waste disposal. Reforms have moved towards tightening the regime of exemptions and privileges. However, one exception introduced by the 2006 reform exempted all state-owned organizations from pollution charges.

The system of environmental funds has proven its role as a reliable source of funding for environmental purposes. Revenues accruing to the National Fund for Nature Protection include 25 per cent of the revenues of the system of local funds, income from participating enterprises, voluntary contributions and publishing activities. In addition, according to the 2004 reform, the National Fund for Nature Protection receives 50 per cent of the fines and claims for environmental damage which result from the activities of central environmental inspectors.

However, an increased emphasis on transparency, methodological work and improved policy analysis would improve the National Fund's effectiveness. Earmarked funding can play an important role in channelling financing towards environmental purposes and shielding environmental policies from competing claims on resources. Enterprises carry out the bulk of environmental spending in the country. They can benefit from tax breaks when introducing environmentally friendly technologies that are certified by environmental authorities, which ensure that these technologies fulfil the necessary requirements. According to the rules governing environmental funds, enterprises' environmental expenditures can be offset against payments due for pollution charges.

Water management for sustainable development

There is a huge disparity between the amount of water resources that are generated (about 10 per cent) and the total amount of water resources used in the country. Irrigation consumes 90 per cent of the total volume of water used. There are huge losses of water in the agricultural sector due to the degraded irrigation infrastructure and the application of obsolete irrigation techniques. The current quality of the country's water resources remains extremely unsatisfactory, resulting in the increase in morbidity rate (kidney disease, oncological and acute infectious diseases), and adult and child mortality rates.

Ongoing reforms aim at the rational use and protection of water resources. The creation of the two-level system of national water resources management, through the establishment of the basin administrations of irrigation systems and water user associations, has become the most important component of the reforms.

Although the in-stream disposal of public utility wastewater has been decreasing in recent years, the purification rate is not sufficiently high. The low operating efficiency of wastewater treatment plants results in an increased concentration of pollutants in surface water streams and depression reservoirs. Moreover, treated wastewater is reported to contain increased concentrations of ammonium and nitrites. Given that main water streams can no

longer be used as sources for drinking water supplies, adequately providing the population with good quality fresh drinking water is one of the country's most serious problems.

Land management and protection

Agriculture is one of the key and most vulnerable sectors of Uzbekistan's economy, contributing to GDP by 30.7 per cent in 2007. With regard to food security, agriculture accounts for 80 per cent of the entire food consumption in Uzbekistan. In 2007, 64.1 per cent of the total population lived in rural areas. Almost 88 per cent of the population lived under the threat of desertification, a figure likely to increase as a result of climate change. Sustainable development in the agricultural sector is a high priority for preventing migration from the rural areas, easing social frictions and maintaining social stability.

Cotton is the country's most important cash crop. Uzbekistan is still the world's second largest cotton exporter after the United States. The amounts of irrigation water, pesticides and fertilizers required for cotton cultivation are high, and significantly higher than those required for wheat. The level of direct state intervention in the production of cotton and wheat has remained high, and there are no pricing incentives to rationalize the use of basic resources, particularly water.

Land management faces problems such as soil salinity, soil erosion and the contamination of soil by harmful substances. Despite the stabilization after the more negative trend in the 1990s, the overall degree of land degradation in irrigated areas is high, with about 55 per cent suffering from degradation and reduced fertility levels in some form. The main threats faced by irrigated land are salinization, the elevation of groundwater levels, soil drifting, irrigation erosion and ravine erosion.

Overgrazing caused the degradation of more than 16.4 million ha (or 73 per cent) of grazing land. Pastures are the most widespread form of land use for agricultural purposes. Permanent meadows and pastures cover 54 per cent of the country's territory, compared to 11 per cent of arable lands. Moreover, the removal of vegetation for fuel and firewood initiates erosion processes, including water erosion on sloping lands.

Unsustainable management practices are widespread and pose the threat of further land degradation. The lack of crop rotation and large-scale cotton and wheat production, together with the limited use of organic fertilizer, lead to low organic matter content in the topsoil and reduced soil fertility.

Energy and the environment

In 2000, Uzbekistan's energy intensity (primary energy consumption per unit of GDP) was about 4 times higher than the energy intensity of China. To reinforce its action as regards energy efficiency, in 2002 the Cabinet of Ministers adopted the Programme on Energy Efficiency until 2010. The first concrete and positive step to implement the programme is the progressive installation of meters for water and heating.

Despite the great potential of renewable energy, especially solar energy, there is no plan to develop renewable energy sources. At the institutional and political levels, there are no general targets in terms of the rational use of renewable energy sources. To date, only hydroelectricity, which represents about 10 per cent of the installed electric power, is being developed.

On the contrary, Uzbekistan anticipates increasing the share of coal from 5 to 10 per cent in the next five years, which would lead to a large increase in emissions. However, although this objective for 2010 was mentioned in the first EPR, it has not been realized. The oil and gas processing industry is the second largest fixed source of the country's air pollution. The high sulphur content (up to 2.7 per cent) in crude oil and an absence of desulphurization lead to high sulphur dioxide emissions from thermal power stations, boiler houses and refineries (58.8 per cent of industrial emissions and 30.7 per cent of the total sulphur dioxide emissions in the country).

Climate change and the environment

Uzbekistan participates in the Clean Development Mechanism (CDM) as a non-Annex I party to the United Nations Framework Convention on Climate Change (UNFCCC) and a non-Annex B party to the Kyoto Protocol. At the time of review, Uzbekistan was the only Central Asian country with six projects, all on nitrous oxide (N₂O) reductions, registered by the CDM Executive Board of the UNFCCC. Other projects focusing on carbon dioxide (CO₂) and methane (CH₄) reduction were not selected. N₂O emissions account for only approximately 5 per cent of total emissions in the country, whereas the majority of emissions come from CO₂ and CH₄. Additionally, it is likely that greenhouse gas (GHG) emissions will increase as a result of the country's energy policy, which favours the conversion from gas to coal in electricity production.

However, at the same time, the country is implementing a major change in its energy policy, reverting back to the use of brown coal in energy generation. Specifically, a threefold increase in coal production to approximately 10 million tons and a more than fourfold increase in the share of coal-fired energy production from 3.9 to 15 per cent are being implemented. No official estimates are available of the GHG emissions caused by the conversion from gas to coal. Nevertheless, significant steps have been taken in order to adjust energy policy to the new realities imposed by climate change, including tariff-based and non-tariff-based measures.

Melting glaciers and snow reserves, the drying up of the Aral Sea and indications of high water losses through evaporation, outdated irrigation practices and infrastructure underline the close links between climate change, water security and development in Central Asia, especially in Uzbekistan. It is imperative to accelerate the adoption and implementation of measures to reduce the wasteful use of water and energy and to encourage more sustainable forms of agricultural development to ensure the country's sustainable development and stability.

INTRODUCTION

I.1 Physical context

Uzbekistan is a doubly landlocked Central Asian country bordered by Kazakhstan to the west and north (border length: 2,206 km), Kyrgyzstan (1,099 km) and Tajikistan (1,161 km) to the east, and Afghanistan (137 km) and Turkmenistan (1,621 km) to the south and south-west. Uzbekistan has a territory of 447,000 km², stretching 1,425 km from west to east and 930 km from north to south, of which the Autonomous Republic of Karakalpakstan occupies an area of 160,000 km². About 22,000 km² (or 4.9 per cent) of the country is occupied by water.

The general topography of Uzbekistan is very diverse, ranging from the desert flatlands covering almost 80 per cent of the territory, to the mountainous eastern regions with peaks reaching about 4,500 m above sea level. The lowest point of the country, Sariqamish Kuli, is 12 m below sea level, and the highest point is a 4,643 m high unnamed peak in the Gissar Range on the border with Tajikistan. The highest named peak is Adelunga Toghi (4,301 m).

South-eastern Uzbekistan is characterized by the foothills of the Tian Shan mountains, which have much higher peaks in neighbouring Kyrgyzstan and Tajikistan and form a natural border between Central Asia and China. The mountain areas have frequent and significant seismic activity, with strong earthquakes up to 10 on the Richter scale. In 1966 much of Uzbekistan's capital city, Tashkent, was destroyed by a major earthquake.

Temperatures vary between extremes, depending on altitude and other topographical features. The plains area has a continental climate with hot and dry summers and short, cold winters. In January, the average temperatures range from 2.8°C to -8°C, but the minimum temperature can drop to -38°C. The hottest summer month is July, and, in mountainous areas, July and August. The average summer temperature is from 25°C to 32°C, although temperatures of 42°C to 47°C are a common phenomenon on the plains and in the foothills, while in the desert region the temperature may reach more than 50°C.

Most of the country is quite arid, with average annual rainfall between 100 and 200 mm, which is lower than the rate of evaporation. Precipitation is very seasonal: most of the rain occurs in winter and spring, while little precipitation falls between July and September, essentially stopping the growth of vegetation during that period. Dry, hot air, combined with high evaporation, leads to the rapid mineralization of soils lacking adequate drainage. In addition to mineralization, the plains and foothills have strong, dry, hot winds that cause land erosion.

The plains region consists of deserts and steppes. The vast Kyzyl Kum Desert extends to southern Kazakhstan, dominating the northern lowland portion of Uzbekistan. East of the Kyzyl Kum, surrounded by mountain ranges to the north, south and east, is the Fergana Valley (about 21,440 km²), the most fertile part of the country. The western end of the Fergana Valley is defined by the course of the Syr Darya River (2,212 km long), which runs from southern Kazakhstan along north-eastern Uzbekistan into the Kyzyl Kum Desert.

In general, the water resources in Uzbekistan are scarce and unevenly distributed, thus causing water supply shortages in most of the country. The two major regional rivers, the Amu Darya River (2,580 km long) and the Syr Darya River, which originate in the mountains of Tajikistan and Kyrgyzstan, respectively, are the source of life-giving water in Uzbekistan. They belong to the Aral Sea basin. The Aral Sea, divided almost equally between Uzbekistan and Kazakhstan, lost about 40 per cent of its remaining surface area in a six-year period (from 28,687 km² in 1998 to 17,160 km² in 2004) (map 4.1). The surface area of the Aral Sea continues to diminish, and the remaining water currently forms three separate lakes.

I.2 Resources

Uzbekistan is rich in resources, which include agricultural products – mainly cotton; carbohydrates like natural gas, petroleum and coal; and mined minerals such as gold, uranium, silver, copper, lead, zinc, tungsten and molybdenum.



A flora species in Uzbekistan

Cotton is the most important cash crop. The cultivation area for cotton dropped by 25 per cent between 1990 and 2006 (from 2 million to 1.5 million hectares). The amount of cotton produced dropped from the pre-independence annual level of 5 million tons to 3.63 million tons in 2007. The importance of cotton as an export crop diminished from 45 per cent of exports in early 1990 to 17 per cent in 2006. However, Uzbekistan is the second largest exporter of cotton in the world and produces three times more cotton than all other Central Asian countries put together.

The pursuit of food security for a rapidly growing population has had its effect on agricultural priorities. The area of land used for wheat cultivation has increased, while the area used for cotton cultivation has diminished. The area of land used for wheat cultivation has grown over 60 per cent in 25 years. In 1990, wheat was cultivated on 1 million hectares of land, and in 2006 this area had grown to 1.6 million hectares. In addition to a high level of wheat production, Uzbekistan is the largest producer of jute in Central Asia; it also produces significant quantities of silk, fruit and vegetables. In 2006, agricultural production constituted nearly 8 per cent of the country's total export income.

Uzbekistan has enough natural gas reserves to satisfy its domestic demand. Natural gas production reached 60 billion cubic metres in 2005 and is an important

export product. Oil reserves are nearly sufficient for domestic consumption. Oil production is in decline – it peaked at 59.1 million barrels in 1999, but diminished to 39.4 million barrels in 2005.

Mining, and gold mining especially, has been the backbone of Uzbekistan's economy. Although data on gold mining is scarce, it is clear that gold is the country's largest export commodity. The country's proven gold reserves are calculated to be 2,100 tons – the sixth largest in the world. Estimated reserves can be as high as 3,350 tons. With annual production somewhere between 80 and 85 tons, or about 3 per cent of the total global production, Uzbekistan is the world's ninth largest gold producer.

1.3 Demographic and social context

The population of Uzbekistan forms almost half of Central Asia's total population. The population is heavily rural (66 per cent), and most of the country's 27.2 million people live in the south and east of the country. Population density varies significantly due to the variations in the country's geographical features. In 2007, the average population density was 61 people per square kilometre; however, density varied from 590 people per square kilometre in the fertile Andijan region to 8 people per square kilometre in the Navoi region, of which the Kyzyl Kum Desert covers a large portion.

Table I.1: Demographic and health indices, 2000–2007

	2000	2001	2002	2003	2004	2005	2006	2007
Population (in millions)	24.8	25.1	25.4	25.7	26.0	26.3	26.6	26.9
Birth rate (per 1,000)	..	..	..	..	..	..	..	..
Total fertility rate	2.6	2.5	2.5	2.4	2.5	2.4	2.4	..
Life expectancy at birth (in years)	..	..	..	..	..	..	..	..
Life expectancy at birth: male (in years)	68.4	68.9	68.9	69.4	68.9	69.6	70.2	..
Life expectancy at birth: female (in years)	73.2	73.6	73.5	73.8	73.6	74.1	74.9	..
Percentage of population aged 0–14 years	37.8	36.7	35.7	34.8	34.0	33.2	32.4	31.6
Percentage of population aged 65+ years	4.2	4.2	4.3	4.4	4.7	4.7	4.7	4.6
Mortality rate (per 1,000)	..	..	..	..	..	..	..	..
Infant mortality rate (per 1,000)	19.1	18.4	16.6	16.5	15.3	15.0	14.5	..

Source: UNECE database, August 2008.

Uzbekistan is among the few countries of Eastern Europe, Caucasus and Central Asia that has seen a population increase since 1990. Since 2000, demographic development has been very positive. Life expectancy is higher than in other Central Asian countries, and, while both men and women live longer, the difference between their life expectancy has diminished to 4.7 years. Infant mortality decreased by 24 per cent between 2000 and 2006. The high birth rate and lower infant mortality rate have made the Uzbek population very young – 31.6 per cent of people are younger than 14 years of age (table I.1).

Although Uzbekistan has a large number of different ethnic groups, the huge majority of people, about 80 per cent of the population, are Uzbeks. The other ethnic groups include Russians (5.5 per cent), Tajiks (5 per cent), Kazakhs (3 per cent), Karakalpaks (2.5 per cent) and Tatars (1.5 per cent) (1996 estimates). The nation is approximately 90 per cent Sunni Muslim, 1 per cent Shiite Muslim, and 5 per cent Eastern Orthodox. Although Uzbek is the official state language, Russian is the de facto language for inter-ethnic communication and for handling much of the day-to-day government procedures and business.

In 2005, the United Nations Development Programme (UNDP) Human Development Index for Uzbekistan was 0.702, ranking it 113th out of 177 countries; in 2001, it ranked 99th out of 162 countries. Although the two Human Development Index rankings are not fully and strictly comparable, this significant drop in ranking illustrates the presence of social sector challenges, despite the economic development of the country.

Gender issues have three main topics. First, the current employment problems seem to maintain

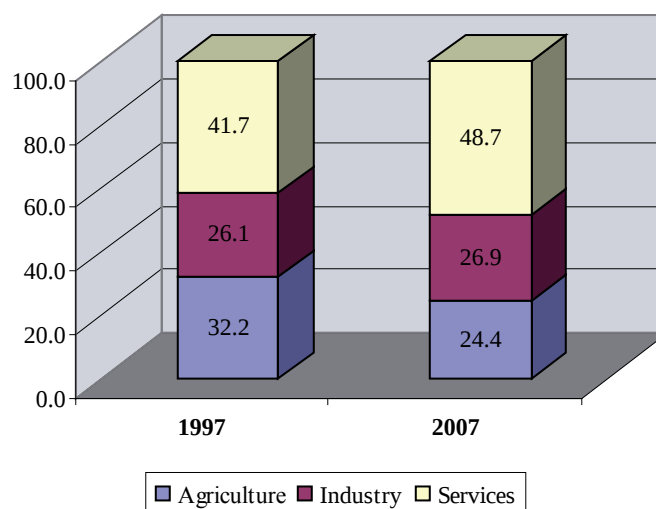
the gender segregation of the labour market, with women still being concentrated in lower paid, lower status jobs. Second, in rural areas, the shift to private farms is not benefiting women. Women are also underrepresented in the bodies dealing with the management and distribution of these resources. Third, even though the literacy rate is 100 per cent for both sexes, and universal access to primary and secondary education has been attained, the gender gap has moved to the higher education level. Boys are more likely to go to academic colleges, while girls will attend vocational colleges. This will increase the existing gender imbalance in higher education and reinforce labour market segregation.

I.4 Economic context

After gaining independence in 1991, Uzbekistan experienced several years of economic decline; however, its 24 per cent decrease in real Gross Domestic Product (GDP) by 1996 was unquestionably less severe than the 40 per cent decrease that took place in most countries of Eastern Europe, Caucasus and Central Asia.

Economic recovery with modest but consistent growth had begun by 1997. Between 2000 and 2003, GDP annual growth rates were consistently between 4 and 4.5 per cent. Economic development started to accelerate in 2004. Since then, the economy has had much higher growth rates – between 7 and 9.5 per cent on average annually. GDP real growth in 2007 was 9.5 per cent.

Uzbekistan's official per capita GDP has nearly doubled in recent years, soaring from US\$ 465 in 2004 to US\$ 832 in 2007; a figure that places Uzbekistan at the upper end of the low-income country list. The annual average real income growth

Figure I.1: GDP by sector in 1997 and 2007, percentage of total GDP

Source: World Bank website (accessed in May 2009).

since 2001 has been 16.2 per cent, and real incomes grew 2.5 times between 2000 and 2006. It is too early to analyse the effect of the global downturn that started in 2008 on Uzbekistan's economy and GDP development, especially because short-term economic data are not available.

Most of the growth has occurred in the services industry (13.5 per cent), largely from revenues from gas transit, telecommunications and a growing financial market. Industry grew by 12 per cent, led by the increased production of fuel, machinery and metals. Agriculture, which accounts for approximately 20 per cent of GDP, grew by only 4 per cent, due in part to a combination of drought and degrading soil quality.

The Uzbek economy is in the middle of a profound transformation process. The Government has taken a gradual, step-by-step approach to structural reforms, cautiously introducing the features of an open-market economy through measures such as the adjustment of energy prices, current account convertibility and lease-holding for collective farms. The composition of economic activity has clearly moved from agriculture to the service industries (figure I.1).

Commodity price rises for major exports (energy, cotton, minerals) accounted for a substantial share of economic growth during the recent period of expansion. At the same time, the country's dependency on a limited number of export commodities will potentially make the economy vulnerable to wide export earning fluctuations.

According to International Monetary Fund estimates, inflation, which usually ran in double-digit figures and reached a low of 6.6 per cent in 2004, seems to be on the rise again, reaching 14.2 per cent in 2006.

The rapidly increasing population and structural changes in the economy are causing serious problems. First, the working age population has grown considerably faster than formal sector employment since the mid-1990s, while the dismantling of shirkat farms (cooperative entities) has created an army of job seekers. The labour market does not seem to be able to create new jobs and absorb the excess supply of new entrants into the workforce. Second, not only is the size of the workforce a problem, worker skills are also an issue. There seems to be an imbalance between the quality and training of the workforce and employer requirements.

Unemployment is officially extremely low – just 4 per cent of the labour force in 2006 – although independent estimates by international organizations are 4 to 5 times higher. Low unemployment figures are related to underemployment, which is particularly significant in the agricultural sector. This is noteworthy taking into account that two thirds of the population of Uzbekistan is rural and that agriculture produces one third of the country's GDP.

Labour migration, at both the international and national levels, has surged. A rapid increase in the number of international labour migrants, mainly to the Russian Federation and Kazakhstan, has taken place in recent years. According to the estimates of the

Russian Migration Service, about 1.5 million Uzbek citizens were working in the Russian Federation in 2007. Worker remittances have become an important source of income for many Uzbek households, and they are estimated to have grown sixfold from 2002 to 2006, amounting to US\$ 1.4 billion in 2006. Since these remittances constitute up to 10 per cent of country's GDP, Uzbekistan's economy and economic policy are bound to migration policy and also to the decisions and policies of migrant-receiving neighbouring countries.

Internally, the workforce is migrating from rural to urban areas and from poor to better-off regions. The Government, however, does not encourage internal migration from rural to urban areas because of concerns over the congestion of cities. Citizens are required to have residence permits (*propiska*) before they can be employed officially. The residence permit system is very strictly enforced in Tashkent and other major cities.

Although economic growth has reduced the poverty gap to some extent, much more needs to be done, particularly in rural areas. Between 2001 and 2005, the difference between the poverty rate in urban and rural areas grew from 8 per cent to almost 12 per cent. The rural population represents over 64 per cent of the total population, yet the proportion of disadvantaged people living in rural areas is 74.7 per cent. There are also regional disparities: the highest poverty rate is in the Autonomous Republic of Karakalpakstan (44 per cent), the second lowest in

the Fergana region (15.8 per cent), and the lowest in Tashkent City (6.7 per cent).

1.5 Institutions

The Constitution of Uzbekistan provides for the separation of powers, freedom of speech and a representative government. Uzbekistan is best described as a presidential republic where the executive seems to hold almost all of the power. The President is elected by popular vote for a seven-year term and is the Head of State and Government.

The President appoints a prime minister and a full cabinet of ministers. The Cabinet of Ministers consists of the Prime Minister, six Deputy Prime Ministers and 14 Ministers (table I.2).

The bicameral Supreme Assembly or National Assembly (*Oliy Majlis*) has 120 members in the Legislative Chamber, elected from geographical constituencies in multiparty elections for a five-year term, and 100 members in the Senate, 16 of which are appointed by the President and 84 of which are elected by the Parliament of the Autonomous Republic of Karakalpakstan and by the sessions of regional, district and city deputies.

The *Oliy Majlis* enacts legislation, which may be initiated by the President, parliament, the high courts, the Procurator General, or the government of the Autonomous Republic of Karakalpakstan. Besides legislation, international treaties, presidential decrees

Table I.2: Ministries (as of 24 February 2009)

Ministry of Foreign Economic Relations, Investments and Trade
Ministry of Economy
Ministry of Finance
Ministry of Agriculture and Water Management
Ministry of Labour and Social Protection of the Population
Ministry of Higher and Secondary Special Education
Ministry of Public Education
Ministry of Health
Ministry of Culture and Sports
Ministry of Defence
Ministry of Internal Affairs
Ministry for Emergency Situations
Ministry of Foreign Affairs
Ministry of Justice

Source: <http://www.gov.uz/en/group.scm?groupId=1785>
(accessed on 20 July 2009).

and declarations of a state of emergency must also be ratified by the Oliy Majlis. However, the legislature, which holds a few sessions each year, has little power to shape laws.

The Oliy Majlis may be dissolved by the President with the concurrence of the Constitutional Court; however, since the Constitutional Court members are appointed by the President, the dismissal clause weighs the balance of power towards the executive branch. De facto, the President's power to dissolve the Oliy Majlis negates its power of veto over presidential nominations.

The judiciary includes the Supreme Court, the Constitutional Court and the High Economic Court. Lower court systems exist at the regional, district and town levels. Judges at all levels are appointed by the President and appointments at the national level must be approved by the Oliy Majlis. Through the appointment process, the nominally independent judicial system remains under the control of the executive branch.

Uzbekistan is administratively divided into twelve regions, the Autonomous Republic of Karakalpakstan and the capital city of Tashkent. Presidential powers include the selection and replacement of regional governors.

1.6 Major environmental concerns

Despite its rich and varied natural environment, decades of environmental neglect, combined with environmentally unfriendly economic policies, have made Uzbekistan the centre of several serious environmental crises. The extraction of huge amounts of water for irrigation purposes from the two rivers in the region, the widespread use of agrochemicals and the insufficient treatment of waste water are causing health and environmental problems on a significant scale.

Aral Sea

The most serious example of the environmental problem is the man-made Aral Sea disaster. Once the world's fourth largest saline water body, with an area of 68,000 km², the Aral Sea has been steadily shrinking since the 1960s, after the Amu Darya and Syr Darya Rivers that flowed into it were diverted for irrigation purposes. By 2004, the sea had shrunk to a quarter of its original surface area, and the nearly fivefold increase in water salinity had killed most of

its natural flora and fauna. By 2007, it was only 10 per cent of its original size and had split into three separate lakes, two of which are too salty to support fish. The once prosperous fishing industry has been virtually destroyed, and former fishing towns along the original shores have become ship graveyards, with a shoreline that has moved tens of kilometres away. The collapse of the fishing industry – the main local industry – has brought unemployment and economic hardship for the region's population.

As a result of weapons testing, industrial projects, pesticide use and fertilizer run-off, the Aral Sea is heavily polluted. Wind-blown salt and dust from the dried seabed damages the region's agriculture and ecosystems, pollutes drinking water and causes serious public health problems. The retreat of the sea has reportedly also caused local climate change, with summers becoming shorter, hotter and drier, and winters colder, longer and without snow. Every year, tons of salt is carried as far as 800 km away. Salt and dust storms from the Aral Sea have raised the level of particulate matter in the Earth's atmosphere by more than 5 per cent, seriously affecting global climate change.

There is an ongoing effort in Kazakhstan to save and refill with water what remains of the northern part of the Aral Sea (the Small Aral Sea). A dam project that was completed in 2005 has raised the water level of the Small Aral Sea by 8 m and resulted in a drop in water salinity, which has replenished fish stocks so that some fishing is viable. However, the outlook for the far larger southern part of the Aral Sea (the Large Aral Sea) remains bleak (chapter 4).

Salination, chemicals and fertilizers

The large-scale use of chemicals for cotton cultivation, inefficient irrigation and poor drainage systems have led to a high filtration of contaminated and salinized water back into the soil. As a result, the freshwater supply has received further contaminants. Almost 50 per cent of all irrigated land is classified as saline, and about 5 per cent (213,000 hectares) of irrigated land is severely saline.

The combination of insufficient fertilization, the failure to practice crop rotation and soil salinization are affecting the productivity of the land. In recent years, the hectare yield of cotton has decreased about 20 per cent in the Khorezm region, and by almost 30 per cent in Karakalpakstan.

The drying up of the Aral Sea is resulting in growing concentrations of chemical pesticides and natural salts; these substances are then blown from the increasingly exposed lake bed and contribute to desertification.

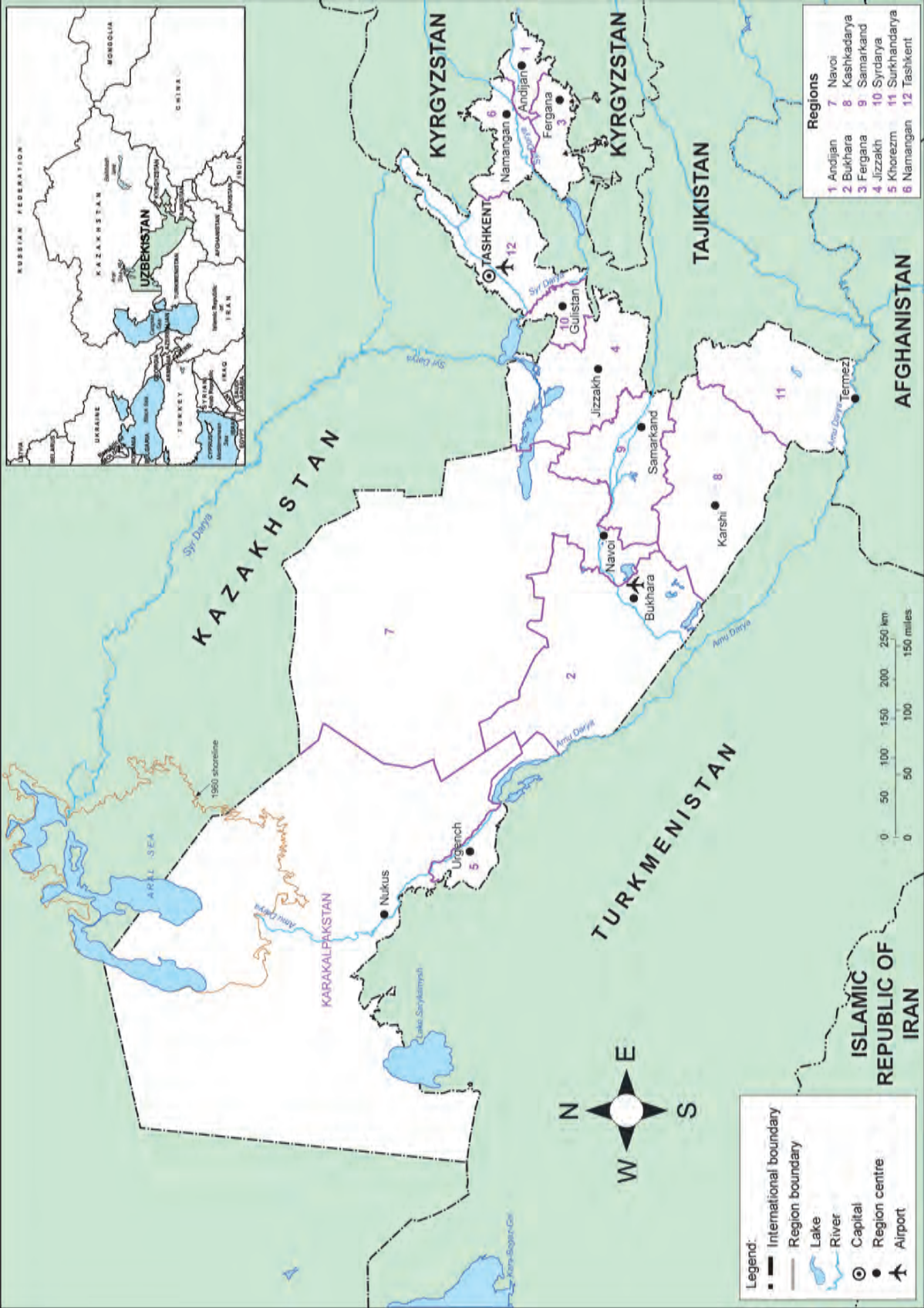
Water pollution from industrial waste and soil contamination from the widespread use of fertilizers, pesticides and agricultural chemicals (including DDT) are causing many human health disorders.

Table I.3: Selected economic indicators, 2000–2008

	2000	2001	2002	2003	2004	2005	2006	2007	2008
GDP (% change over previous year)	4.0	4.5	4.2	4.4	7.7	7.0	7.3	9.5	..
GDP in current prices (million US\$ PPP)	..	..	..	..	..	..	..	..	..
GDP in current prices (million US\$)	13,761.0	11,642.0	9,683.0	9,949.0	11,951.0	13,655.0	17,022.0	22,298.0	..
GDP in current prices (million sum)	3,255,600	4,925,300	7,469,300	9,664,100	12,189,500	15,210,400	20,759,300	28,186,200	..
GDP per capita (US\$ per capita)	..	..	..	..	..	..	..	..	..
GDP per capita (US\$ per capita PPP)	..	..	..	..	..	..	..	..	..
CPI (% change over the preceding year, annual average)	..	..	27.3	11.6	6.6	10.0	14.2	..	..
PPI (% change over the preceding year, annual average)	..	..	..	..	..	..	..	..	..
Registered unemployment (% of labour force, end of period)	0.4	0.4	0.4	0.3	0.4	0.3	0.3	0.2	..
Current account balance (million US\$)	215.0	..	117.0	881.0	1,215.0	1,949.0	3,136.0	4,370.0	..
Current account balance (as % of GDP)	1.6	..	1.2	8.9	10.2	14.3	18.4	19.6	..
Net FDI inflows (million US\$)	..	..	..	..	..	..	..	..	..
Net FDI flows (as % of GDP)	..	..	..	..	..	..	..	..	..
Cumulative FDI (million US\$)	..	..	..	..	..	..	..	..	..
Foreign exchange reserves (million US\$)	..	..	..	..	..	..	..	..	..
Gross external debt (million US\$)	4,419.0	4,684.0	4,763.0	4,249.0	4,322.0	4,133.0	3,938.0	4,937.0	..
Exports of goods and services (million US\$, PPP)	..	..	..	..	..	..	..	..	..
Imports of goods and services (million US\$, PPP)	..	..	..	..	..	..	..	..	..
Net exports of goods and services (million US\$, PPP)	..	..	..	..	..	..	..	..	..
Ratio of gross debt to exports (%)	..	..	..	..	..	..	..	..	..
Ratio of gross debt to GDP (%)	32.1	40.2	49.2	42.7	36.2	30.3	23.1	22.1	..
Exchange rates: annual averages (sum/US\$)	236.58	423.08	771.42	971.35	1,019.94	1,113.89	1,219.59	1,264.07	1,320.94
Population (million)	24.8	25.1	25.4	25.7	26.0	26.3	26.6	26.9	27.2

Source: UNECE Statistical Database, 2009.

Map I.1: Map of Uzbekistan



Source: United Nations Cartographic Section, 2009.
Note: The boundaries and names shown on this map do not imply official endorsement or acceptance by the United Nations.

***PART I: POLICYMAKING, PLANNING AND
IMPLEMENTATION***

Chapter 1

POLICYMAKING FRAMEWORK FOR SUSTAINABLE DEVELOPMENT AND ENVIRONMENTAL PROTECTION

1.1 Changes since 2001 and current context

Since the first Environmental Performance Review (EPR) in 2001, Uzbekistan has moved through significant periods of economic development, liberalization and privatization. The result in overall growth has been impressive: since 2002, gross domestic product (GDP) has grown from a rate of 4 per cent to a consistent rate of 7 per cent from 2005 to the present. Government policies have supported macroeconomic stability, encouraged economic growth, improved the business environment and facilitated private sector development. Although the world economic recession has not had a great impact on Uzbekistan, at the end of 2008 the Government decided to introduce a large-scale anti-crisis package targeted at export promotion, greater demand for domestically produced goods, higher energy efficiency and the further development of small and medium-sized enterprises.

Economic growth puts increasing pressures on sustainable development in the fields of agriculture and industry, resource extraction, the use of water and energy, among others. Owing to its vast areas of irrigated land, Uzbekistan is the largest water user in Central Asia. This has a negative impact on the country's water quality, biodiversity and wetlands. It also contributed to the disappearance of the Aral Sea and its ecosystem. Deteriorating irrigation and drainage infrastructure threaten further land degradation. The growing energy sector requires new investments in technology to make it more efficient and less polluting. Mining carries the risks of land degradation and hazardous waste.

Since 2001, the Government has made efforts by amending and developing the legal framework to address these concerns. New laws have been passed, for example, on mining, waste, land management, among others. The legal basis for increased public participation and public access to information – a keystone of good environmental protection – is also being laid.

1.2 Strategies, programmes and plans for sustainable development

National Sustainable Development Strategy

The 1997 National Sustainable Development Strategy (NSDS) continues to serve as the overarching framework for sustainable development and functions as the basic reference document for all strategies and legislation. In theory, a strategy, plan, programme or law cannot be adopted if it is not consistent with the NSDS.

The Strategy is essentially a statement of principles to guide development in all sectors in the country. It seeks to provide a healthy life for all people by ensuring progressive and stable socio-economic growth; to promote a market economy; to integrate the economy into the world market; to overcome the consequences of the ecological crisis of the Aral Sea and stabilize the ecological situation in other zones of the country; and to maintain and improve a favourable environment, ensuring the rational use of land and water resources and the effective use of other natural resources in order to preserve them for coming generations.

Privatization Programme for 2007–2010

The 2007 Privatization Programme for 2007–2010 is the current basic document specifically for guiding the Government's economic policy. It envisages continued economic growth, to a large extent, through the complete or partial privatization of approximately 1,500 enterprises, facilities and state-owned shareholdings in the textile, electrical equipment and agricultural machine-building industries, together with major wholesale trade enterprises, machine-tractor parks in the agricultural sector, many chemical enterprises, major construction and international cargo companies, wine-production companies, recreational zones and other recreational facilities. Production and social infrastructure facilities in the oil and gas and power industry are to be privatized, and up to 49

per cent of shares in industries such as thermal power plants, railway companies and automobile production (49–50 per cent) are to be sold.

Welfare Improvement Strategy for 2008–2010

The 2007 Welfare Improvement Strategy for 2008–2010 is focused on harnessing this accelerated growth to reduce poverty in the country. Prior to the Strategy's development and adoption, there were two interim documents: the Living Standards Improvement Strategy for the Population of Uzbekistan 2004–2006 and up to 2010 and the Welfare Improvement Strategy for 2005–2010: Interim Poverty Reduction Strategy Paper. In both cases, a full section was devoted to improving the environment and included the following three "fundamentals":

- Economic and environmental policy integration to conserve and rehabilitate the environment as a necessary condition for improving the quality of life;
- Moving from the protection of separate elements of nature to the general and comprehensive protection of ecosystems;
- Making society as a whole responsible for environmental protection, the preservation of the environment's diversity and improvement in its state, and the establishment of living conditions favourable to people.

However, the final Welfare Improvement Strategy no longer contains a chapter dedicated to the environment. At the outset, it states that: "In order to ensure environmental sustainability, efforts will be continued to integrate the principles of sustainable development into government policies and programmes primarily in the more effective use of natural resources." Explicit environmental concerns refer to the following three areas: (1) returning land to agricultural use; (2) increasing the share of the total area of specially protected natural areas to 10 per cent of the country's territory by 2010; and (3) reducing the usage of ozone-depleting substances by 2015.

Overall, little attention is given to the environment. Most of the Strategy is dedicated to economic and social issues, with an overall emphasis on expanding growth and reducing poverty. For example, the Welfare Improvement Strategy aims, by 2015, to increase GDP per capita by 1.75 in terms of purchasing power parity, and to increase average wages by 2.5 between 2006 and 2010. If successful,

the Welfare Improvement Strategy foresees that by 2015 average wages may be 7.5 times greater than in 2006. Expanding employment opportunities and income generation based on economic growth will be the main means of improving livelihoods. The development of the labour-intensive sectors of the economy is seen as the primary instrument for implementing this priority.

The Welfare Improvement Strategy also addresses all eight of the United Nations Millennium Development Goals (MDGs) (box 1.1). Meeting the poverty target concerning income will require sustained broad-based growth. According to the Asian Development Bank (ADB), Uzbekistan has already achieved universal basic education (MDG 2), with no gender gap (MDG 3). Based on official data, Uzbekistan is likely to meet the under-five mortality rate (MDG 4). It may meet the maternal mortality Goal (MDG 5) with better policies and additional resources. The Goal on combating HIV/AIDS, malaria and other diseases (MDG 6) will be challenging because, although policies for the prevention and treatment of HIV/AIDS, tuberculosis and malaria are in place, public resources are inadequate. Although the gap in sustainable access to safe drinking water (MDG 7) may have closed, the Government will need to target rural areas, where the deficit is much wider than in urban areas (chapter 4).

The Welfare Improvement Strategy also foresees the preparation of two new national strategies directly related to sustainable development and the environment: one on environmental security and the other on renewable energy. Of these, environmental security is currently the subject of a draft law. Should the law be adopted, it may lead to the development of a national strategy. With respect to renewable energy, a concept paper was prepared and sent to the Senate on January 2009, but subsequently returned to the State Committee for Nature Protection (SCNP) with recommendations on how the concept might be developed into a strategy. This is now the subject of consultation and coordination among all the relevant ministries and agencies. The Strategy is expected to be adopted by the end of 2009.

1.3 Strategies, programmes and plans for environmental protection

The 1998 National Environmental Action Plan (NEAP) comprehensively describes the State's environmental policies and establishes both the

Box 1.1: Relationship between the Welfare Improvement Strategy goals and the Millennium Development Goals

The sustainable and equitable development objectives of the Welfare Improvement Strategy correspond to the Millennium Development Goals approved by the United Nations General Assembly in 2000, to which Uzbekistan committed itself.

The necessary improvements in primary and secondary education will be delivered, and the share of women with a higher education increased.

The under-five child mortality rate will be reduced from its 2006 rate by one third, and by another third by 2015. Maternal mortality will be reduced by 15 per cent by 2010, and a further 15 per cent by 2015.

The spread of tuberculosis will be halted by 2010, and the prevalence of tuberculosis will begin to subside by 2015. It is expected that the HIV/AIDS infection rate will be substantially reduced by 2015.

Measures for environmental protection and the rational use of natural resources will enable the reversal of environmental damage, securing tangible results by 2010. The access of urban and rural households to safe drinking water and sanitation will be improved from the 2006 level by 25 per cent by 2010, and by 50 per cent by 2015.

Source: the Welfare Improvement Strategy.

priorities and the agenda for legislation and institutional restructuring. The Plan has not been revised since its adoption. The NEAP goal to define a general strategy for the first stage of the country's transition to sustainable development was set to be achieved through a combination of policies not dissimilar to those of the Welfare Improvement Strategy: sound macroeconomic and sectoral policies, the efficient and sustainable use of natural resources and the setting of environmental quality objectives and standards. The primary difference is that the NEAP focuses less on poverty than the Welfare Improvement Strategy, but much more on environmental sustainability. Along with the NSDS, the NEAP, the 1999 National Environmental Health Action Plan and the 1998 National Biodiversity Strategy and Action Plan continue to be the basic strategies for sustainable development and a sustainable environment.

Neither the National Environmental Health Action Plan nor the National Biodiversity Strategy and Action Plan has been revised. The SCNP, however, acknowledges the need to review the National Biodiversity Strategy and Action Plan. It is currently preparing Uzbekistan's fourth national report to the Convention on Biological Diversity, and plans to use the information collected for this purpose as the baseline data for drafting a revised strategy.

The first implementation plan for these strategies was the Programme for Environmental Protection and the Rational Use of Natural Resources for 1999–2005, developed and coordinated by the Ministry of Economy. Initially, this Programme was funded primarily by national and regional budgets, but, when

the funding proved insufficient, the Government decided to allow the National Fund for Nature Protection to be used for this purpose. As a result, according to the SCNP, implementation reached almost 98 per cent coverage and 85 per cent of specific activities.

In 2008, a second implementation programme, the Programme of Actions on Nature Protection for 2008–2012 (PANP) was adopted for a subsequent five-year period. In contrast to the previous programme, the Programme was developed and coordinated by the SCNP. It also differed in that it was prepared using a bottom-up approach. Each region first developed its own plan and submitted it to the SCNP, which then synthesized these local plans and consolidated them into a single national programme. Furthermore, similar to the Welfare Improvement Strategy and the NEAP, emphasis is placed, for example, on providing access to sanitation and a potable water supply, as well as the rational use of natural resources.

The Programme actually consists of a normative component and an action plan, which consists of a table of actions to be undertaken with an indication of actors, costs and time frames. It covers four major areas supported by 44 projects: 17 projects on environmental protection and ensuring environmental safety, 15 on the rational use of natural resources and the introduction of environment-friendly methods of economic activity and management, 8 on streamlining the legislative framework and the development of environmental research, education and training, and 4 on international cooperation and regional environmental safety.

Box 1.2: Major policy documents adopted since 2001

- Concept of Integrated Sustainable Water Supply
- National Programme on the Development of Irrigation for 2000–2005
- Programme of Electric Power Generation up to the Year 2010
- Programme on Energy Efficiency
- Programme of Actions on Nature Protection for 2008–2012
- State Programme on Providing the Rural Population with Drinking Water and Natural Gas for the Period 2000–2010
- Strategy for the Development of the Irrigation and Drainage Sector
- Welfare Improvement Strategy for 2008–2010

Neither has the 1999 National Action Programme to Combat Desertification undergone any revision. This Programme and the NSDS are the prevailing strategies for combating desertification, as referred to in Uzbekistan's last national report (2002) to the United Nations Convention to Combat Desertification in Countries Experiencing Serious Drought and/or Desertification, Particularly in Africa.

Selected sectoral strategies and major policy documents

The 2002 Concept of Integrated Sustainable Water Supply sets forth the principal direction for water management and amelioration measures for 2008–2011. These directives envisage major improvements in land use through better drainage, an increase in agricultural water supply through the modernization of irrigation, and the introduction of integrated water resources management.

The 2001 Strategy for the Development of the Irrigation and Drainage Sector and the National Programme on the Development of Irrigation for 2000–2005 are closely related to the Concept of Integrated Sustainable Water Supply. These two documents are important instruments for implementing water resources management policy and are of prime importance for agriculture and the environment.

The State Programme on Providing the Rural Population with Drinking Water and Natural Gas for the Period 2000–2010 plans both to extend the coverage of water supply networks to 85 per cent of the population and to reduce per capita consumption in the cities (except for Tashkent City) through installing meters, eliminating leaks and changing water consumption rates, among others. The Programme also envisages providing alternative sources of water and energy supplies to remote areas that cannot be reached through conventional means.

A plan for integrated water resources management is still in preparation and should be completed in the near future (chapter 6).

The 2002 Programme on Energy Efficiency mainly focuses on energy pricing, institutional development, education and information dissemination. The Government also introduced the 2001 Programme of Electric Power Generation up to the Year 2010, which proposes ways to develop the use of thermal power. In addition, a draft law on energy saving and energy efficiency is in preparation (chapter 8).

The National Strategy on Greenhouse Gas Emissions Reduction was approved in 2000 (chapter 9).

Since 2001, seven major strategies and policy documents of relevance to sustainable development and the environment have been adopted (box 1.2). In addition, virtually every sector has an environmental protection programme to 2012 that must be prepared in conformity with the NSDS and the PANP and submitted to the SCNP for comment and coordination.

In 2007, the Senate Committee on Agrarian Issues, Water Management and the Environment approved a draft national waste management strategy and action plan for 2008–2017 aimed at improving waste collection and the treatment infrastructure through better financing and management and the use of administrative, legal and economic incentives to reduce the non-renewable loss of raw material resources. The strategy and its action plan also provide for the creation of regional waste management institutions, monitoring, assessment and the engagement of stakeholders.

1.4 Legal framework

During the period since the first EPR, Uzbekistan has passed a number of new laws and revised others.

These changes have taken place for a variety of reasons, for example: to provide implementation measures for basic normative laws; to address issues previously neglected; and to enable legislation to be consistent with relevant international law and standards (annex IV).

The core environmental legislation covers a number of important issues that had not been previously linked with nature protection and that are increasingly featured in relevant legislation, for example, issues related to public participation, the rights of citizens to access information and appeal and, in some cases, to compensation for damages.

Since its independence, Uzbekistan relies on legislation that is very normative in nature. Broad statements of principles and less than specific indications of procedures and responsible actors have set a strong policy tone, yet inhibited strict implementation. This is beginning to change in some of the newer legislation (for example, the Town Planning Code) and in the development of a significant body of regulatory acts.

Nature protection

The basic environmental law remains the Law on Nature Protection, first enacted in 1992. The 10 successive amendments, the last in 2006, underscored the interrelationship between a number of issues that had not been previously linked in legislation. The amendments did not substantively change the law; they were adopted largely to bring the Law on Nature Protection into line with new laws and programmes or changes to government structures. However, similar to many laws in Uzbekistan, the Law is predominately normative and does not provide mechanisms for implementation. The subsequent development of regulations is beginning to respond to this problem.

The 2003 Cabinet of Ministers Resolution on the Improvement of the System of Payments for Environmental Pollution and Waste Disposal approves the amount of compensation -paid for environmental pollution and waste; the 2005 Cabinet of Ministers Resolution on the Procedure of Application of the Compensation Payments for Environmental Pollution and Waste Disposal addresses the handling of mining waste; and the 2006 Cabinet of Ministers Resolution on the Improvement of the System of Payments for Special Nature Use amends an earlier regulation concerning the responsibilities of the SCNP in terms

of collecting and distributing compensation payments for environmental pollution and provides for an indexation of 1.3 for compensation payments for pollution and waste disposal.

The 1993 Law on Specially Protected Natural Territories was replaced in 2004 by the Law on Protected Natural Areas, which, among other things, brings the law into conformity with the Convention on Biological Diversity, the Ramsar Convention¹ and the Bonn Convention². It identifies seven categories of protected natural territories and details the types of activities that are allowed in each. The SCNP is responsible for state control. However, like its predecessor, this law does not establish clear responsibilities on overall governance. Article 11 states that the management of protected natural areas should be executed by the Cabinet of Ministers, the local authorities and designated public agencies. These designated agencies are not mentioned by name, nor is the delegation of responsibility established.

Sectoral legislation

Uzbekistan adopted a new edition of its 1994 Law on Subsoil in 2002 (Law No. 444-II of 13.12.2002). This Law contains significant provisions of relevance to the environment – for example, that the mining industry must protect the environment and restore damaged land and other natural sites; that activities must be licensed and undergo ecological expertise; and that waste management and waste disposal procedures must be followed. This new law stipulates for the first time that the enterprise owns the waste and has full responsibility for environmental impacts and recultivation. At the same time, there is concern that the environmental requirements in the new edition have been disproportionately minimized by the inclusion of far more provisions for, and emphasis on, economic activity, particularly given the economic importance of the mining sector.

The 1997 Law on the Rational Use of Energy was most recently amended on 26 September 2007. The Law intends to rationalize energy use through a number of measures, including through setting standards and indicators, carrying out energy efficiency inspections, developing energy efficiency

¹ Convention on Wetlands of International Importance especially as Waterfowl Habitat.

² Convention on the Conservation of Migratory Species of Wild Animals.

processes and manufacturing energy efficient products, and by setting up demonstration zones for highly efficient projects. It also establishes a fund to support projects, with funding to come from various public and private sources. Power installations that produce renewable energy or recycle secondary resources and waste are eligible for accelerated amortization rates for capital investments made for that purpose. The Law establishes the use of both seasonal and intraday tariffs for electricity as an incentive for its efficient use (chapter 8).

The 2002 Law on Waste addresses waste management, exclusive of emissions and air and water pollution, and confers authority to the SCNP concerning inspections, coordination, ecological expertise and establishing certain parameters with regard to the locations where waste may be processed. The Law specifies that citizens have the right to a safe and healthy environment, to participate in the discussion of projects, and to compensation for damage to their lives, health or property. Dangerous waste that is transported domestically or internationally must pass ecological certification and be moved by special vehicles. The import of any radioactive waste for storage or burial is strictly forbidden. Although this is not specified in the Law, special privileges are given to persons and enterprises that develop and introduce technologies for reducing or recycling waste. Enterprises are responsible for their waste, but, if they recycle, they may be provided with assistance from the state budget, the National Fund for Nature Protection or voluntary payments.

Other legislation

The 1998 Land Code establishes the basic and comprehensive rules for all categories of land. The Code specifies related rights, establishes procedures for acquiring them and determines the legal grounds for terminating them. Land is state property and cannot be owned privately (chapter 7). The regulations addressing inspection, government control and the single-system of state cadastre were approved to support the Cabinet of Ministers 2005 Resolution on the Regulations on State Geodesy Inspectorate under the State Committee on Land Resources, Geodesy, Cartography and Land Cadastre, on State Control over the Use and Protection of Land, and on the Procedure of Establishing and Maintaining the State Cadastres System.

The 2002 Town Planning Code contains a number of important provisions related to the environment,

public participation and access to information. When infringements of the town planning legislation occur, owners may seek compensation if their living environment has deteriorated or if their life, health or property has been damaged. This is true for both the construction and the demolition of buildings, as well as changes in land use. Town planners must take into account a range of important factors, including, for example, the vulnerability of a site to natural or technological disasters, chemical or biological pollution, and the preservation of cultural heritage and protected natural territories. Citizens have the right to comprehensive and timely information on environmental conditions and any plans that may alter the environment; they also have the right to participate in discussions about town planning processes.

The 2001 Law on the Protection and Use of Objects of Cultural Heritage is primarily directed at the preservation and management of important elements of the built environment, but it also addresses the protection of territories representing historical archaeological, aesthetic, ethnological or anthropological value, as well as natural landscapes connected with historical events and persons.

The 2007 Law on the State Programme for Forecasting and Preventing Emergency Situations emphasizes preparing for and the monitoring of the conditions underlying potential natural and technological emergencies. It establishes a coordination commission for this purpose, headed by the Prime Minister. The SCNP is one of the members of this commission. The SCNP is responsible for the prevention of failures at chemically dangerous installations, along with the Ministry for Emergency Situations.

Two important laws were adopted in 2002: the Law on the Principles and Guarantees of Freedom of Information and the Law on the Appeals of Citizens. Both are applicable to all sectors. Under the Law on the Principles and Guarantees of Freedom of Information, information can be limited only by law, with a view to protecting the rights and freedom of persons, the constitution of moral values, spiritual, cultural and scientific potential and national security. Information on ecological, meteorological, demographic, sanitary and epidemiological emergencies and other information necessary for the safety of people, settlements, industrial facilities and communication cannot be considered confidential. The Law on the Appeals of Citizens provides citizens'



Monument to Temir Amur, Tashkent

rights for administrative appeals and the procedures available for this process (chapter 3).

Regulations

Some of the laws discussed above provide details on implementation procedures and measures. Most of them, however, are normative laws that require further legal or administrative action for their full execution. A major area of legal activity in Uzbekistan over the past several years has been that of designing and adopting regulatory framework laws governing, among others, nature protection, air, water, land, forests and waste (annex IV).

Draft laws

A draft law on environmental security is currently at the early stages of consideration. The purpose of the law is to identify and prevent the development of environmental threats, rehabilitate emergency environmental situations and environmental disaster zones, and establish the legal basis for protection against hazardous environmental impacts. Environmental threats are both direct and indirect. Among the direct threats are those from the testing of military weapons and military operations, including their impact on biodiversity and the landscape; all impacts on hydrometeorological processes; the pollution of air, land, subsoil, and surface and

underground water; the introduction of plants and animals that are alien to the natural biodiversity of their new surroundings or that have been artificially modified; the import of hazardous products and waste; and natural disasters. Indirect threats may result from insufficient knowledge; decision-making without public involvement; insufficient legal mechanisms for nature use and environmental control; and inappropriate technologies. The draft law lays out the responsibilities of all actors, including the duties of owners, and calls for the Cabinet of Ministers to submit environmental security programmes to Parliament no less than every five years.

Two major laws are currently under consideration: the draft law on water and water use (chapter 6) and the draft land code (chapter 7). The draft law on water and water use states that it complies with the main international norms and provisions.

The drafting of an environmental code is envisaged. This could be an important step to consolidate environmental laws and regulations and to show more clearly their interrelationships. It would also indicate where additional legal action might be needed.

1.5 Institutional framework

Although draft laws and codes may originate from a number of executive, legislative and judicial

sources, including, among others, the legislature of the Republic of Karakalpakstan, a ministry, a state committee, the Cabinet of Ministers or Parliament, they can be passed only by Parliament (adopted by the Legislative Chamber and approved by the Senate). The Cabinet of Ministers may adopt resolutions, which are legally binding, or orders, which are essentially normative guidelines and may or may not have legal power. The President is primarily concerned with more administrative issues, for example, defining more specifically what the Government may or should do in executing its mandates. The President may issue decrees, which have legal power and generally refer to rules and procedures, or orders, which are typically short, single-action directives.

State Committee for Nature Protection

The structure and responsibilities of the SCNP have changed little since 2001. Overall, the tasks of the Committee include the following: pursuing state policy on environmental security, nature protection, natural resources use and reproduction; the intersectoral and integrated management of nature protection activities; the establishment and coordination of activities to ensure favourable environmental conditions and rehabilitation of the environment; and nature protection inspections and audits. Since the creation of the bicameral system in 2004, the SCNP reports directly to the Senate.

Altogether, there are nine structural units in the Headquarters of the SCNP (figure 1.1). Consistent with the new Action Plan, the SCNP intends to strengthen its information service and establish a public council, the rules for which still need to be delineated. The Department for Control over the Protection and Use of Land and Water Resources, the Department for Air Protection, and the Department for Nature Use Economics and Management have inspectorate responsibilities. The Head and First Deputy Head of the SCNP are the main inspectors of the country. At the central level, there are 15 inspectors.

At the central level, there are also a number of specialized units and institutes (figure 1.2). The State Specialized Inspectorate for Analytical Control, the Department for Air Protection, the Department for Control over the Protection and Use of Land and Water Resources and the State Inspectorate for the Protection and Rational Use of Flora and Fauna

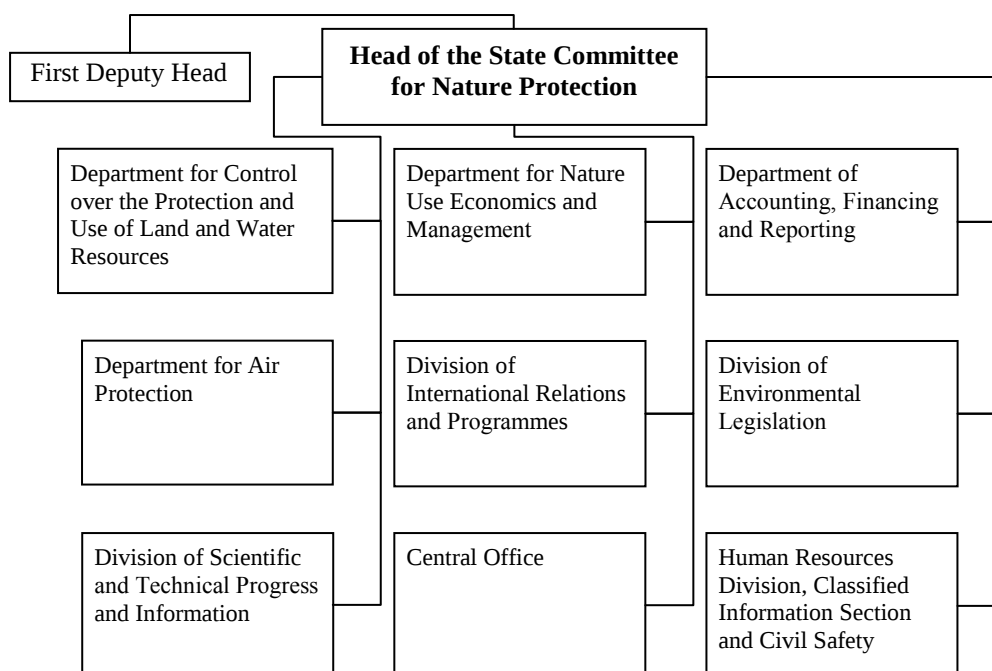
and Nature Reserves are responsible for prevention, monitoring and detection and for taking action to correct non-compliance with environmental requirements (Chapter 2). The most recent unit is the Eco-Energy Science and Implementation Centre, which was established in 2005 to carry out both research and projects on renewable energy.

There are fourteen subordinate committees under the central Committee: one in each of the twelve regions, one in the Republic of Karakalpakstan and one in Tashkent City. The Head of the SCNP, upon the agreement of local authorities, appoints the chairpersons. Under each of these, there is an inspectorate, an assessment department, a certification department and an analytical department. Inspectorates at the regional level have only regional capacity. The National Fund for Nature Protection is also represented at each of the sub-levels.

Further to the 2003 Presidential Decree on Strengthening the Public Administration Authorities, the SCNP produced a draft resolution that would alter to some degree both its functions and structure. This is currently before the Cabinet of Ministers and should be approved in the near future.

Among the functional changes is the responsibility to determine priorities for ensuring environmental security and to develop programmes and measures on nature protection activities. The resolution would also strengthen SCNP management responsibilities for reserves, the hunting and fishing sectors and biodiversity conservation; it also provides greater specifications for issuing permits, undertaking assessments and reaching agreements with enterprises that may have an environmental impact. The right of the SCNP to establish or abolish the organizational entities under its jurisdiction has, however, been abolished.

From an organizational perspective, only minor changes are envisaged. The SCNP senior management includes the Head and the First Deputy Head. The Head of the SNCP is appointed by the President and the appointment is approved by the Senate. With the changes, there would be two Deputy Chairpersons, one of whom would also head the Department for Environment Policy and Environmental Management (established based on the Department for Nature Use Economics and Management). Under this new structure, staff numbers would not increase. On the contrary, staff would be reduced from 32 to 28 in the

Figure 1.1: Headquarters of the State Committee for Nature Protection

Source: State Committee for Nature Protection.

Central Office and from 1,962 to 1,909 at the sub-levels. When it was created in 1988, the SCNP had 81 staff members at the central level.

National Commission for Sustainable Development

Uzbekistan established the National Commission for Sustainable Development in 1997 to coordinate the implementation of the NSDS. Following several amendments in 1999 and 2000, the Commission was placed under the authority of the Vice Prime Minister and an operational working group, with organizational and technical support from the Ministry of Economy (Amendment No. 101 of 05.03.1999 and Amendment No. 358 of 19.12.2000).

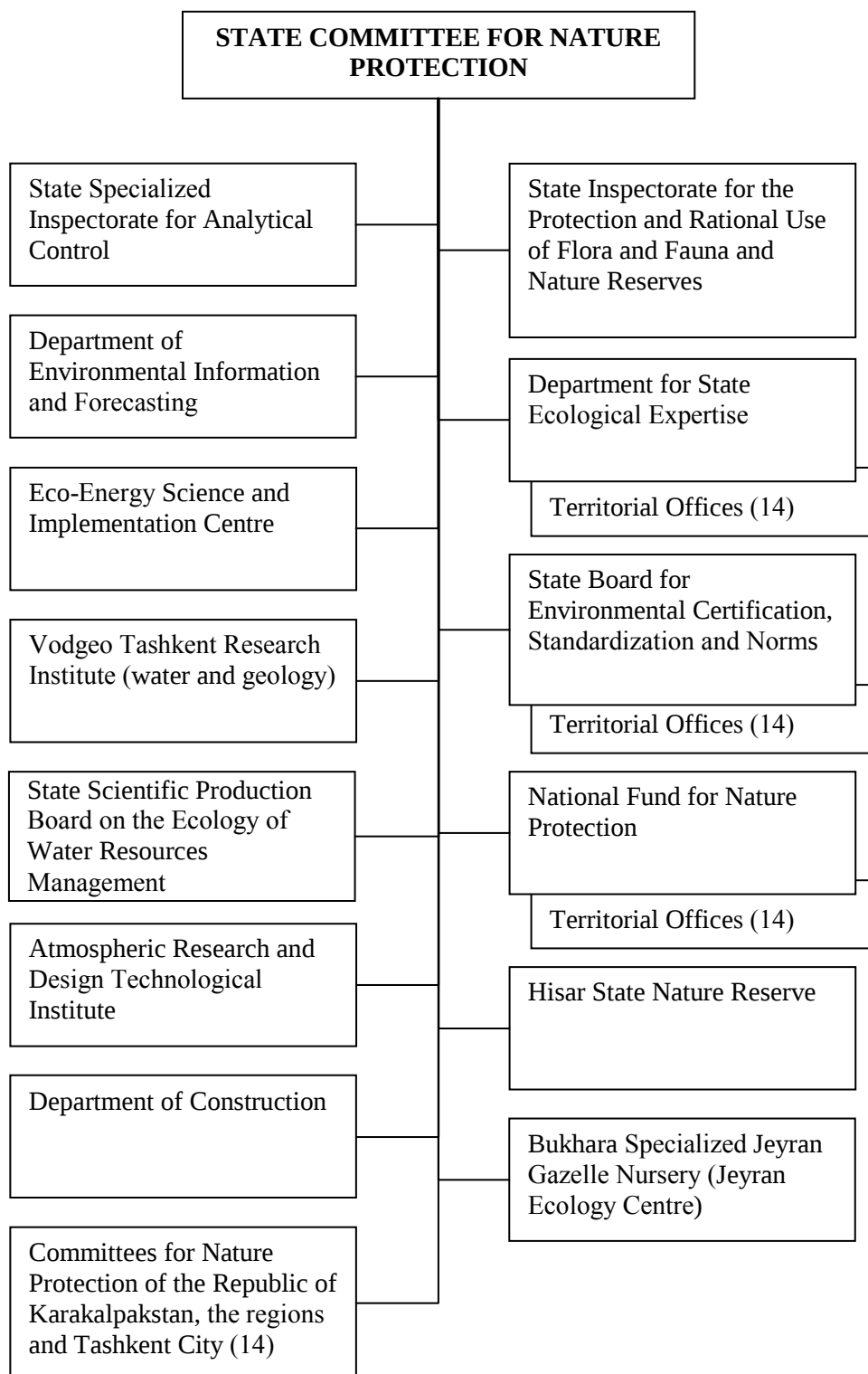
However, the Commission was abolished in 2005 and its policy functions were delegated to the Cabinet of Ministers, while the implementation of the NSDS was delegated to the Information and Analytical Department on Agriculture, Water Management and the Processing of Agricultural Production and Goods within the Cabinet of Ministers.

Other state bodies with environmental responsibilities

Because of the cross-cutting nature of sustainable development and the environment, virtually all other state bodies have some responsibility towards them, ranging from the Ministry of Health and the Ministry of Agriculture and Water Management to the Ministry for Emergency Situations. The main organizations that are required to prepare annual nature protection plans and report thereon to the SCNP including the following:

- Ministry for Emergency Situations;
- Ministry of Health;
- Ministry of Agriculture and Water Management;
- State Committee on Land Resources, Geodesy, Cartography and State Cadastre;
- State Committee on Geology and Mineral Resources;
- Uzbek Hydrometeorological Services;
- Agency for the Implementation of the Global Environment Facility and Aral Sea Basin Programme.

Figure 1.2: Overall structure of the State Committee for Nature Protection



Source: State Committee for Nature Protection.

In addition, the Ministry of Economy, the Ministry of Foreign Economic Relations, Investments and Trade (with respect to imports and exports), the Ministry of Justice, the Ministry of Foreign Affairs (with respect to international commitments), the

State Committee on Geology and Mineral Resources and the State Committee on Land Resources, Geodesy, Cartography and State Cadastre all have responsibilities that are relevant to the work of the SCNP. Should the draft law on environmental

security be enacted, it is foreseeable that the Ministry of Defence will also be involved.

Coordination

Coordination takes many forms: horizontal coordination through, for example, the preparation or monitoring of legislation or policy documents; vertical coordination through, for example, reporting and annual or special meetings.

Horizontal coordination

Any state actor may initiate legislation; however, once it has been agreed upon within a ministry or state committee, it is circulated among all ministries and state committees for comments and suggestions. The draft legislation is then redrafted on the basis of these comments. For more challenging issues, an ad hoc interdepartmental working group may be established to deal with the legislation.

All ministers must sign off the final draft, with the final signature being given by the Minister of Justice. This is intended to ensure that the draft is consistent with other legislation. This same process holds for the preparation of state strategies. Once all ministers have agreed, the draft is sent to the Cabinet of Ministers for further consideration, and from there either to the Office of the President, if it requires a presidential decision, or directly to the Legislative Chamber and the Senate.

Standing inter-agency committees may also be established to coordinate concerns of a continuing nature, such as applications for Global Environment Facility (GEF) funds or Clean Development Mechanism (CDM) projects. These include, for example, the Interdepartmental Commission on GEF Funds, the CDM Interdepartmental Council (chapter 9) and the Working Group on Pesticides and Fertilizers.

With respect to the environment, most relevant ministries and agencies are required to prepare annual nature protection action plans on the basis of the PANP, and report thereon quarterly to the SCNP. The SCNP aggregates this information and presents it to the Cabinet of Ministers and the Senate on both a quarterly and annual basis. As the body to which the SCNP reports, the Senate also coordinates implementation; it reviews the quarterly reports and, if necessary, arranges field trips to different locations to check on implementation, particularly in situations

of poor environmental conditions. The Senate assesses the situation and, as necessary, develops a set of additional measures and plans.

The SCNP has only two means of enforcement: through its State Inspectorate, which intervenes only if an enterprise or other entity is in conflict with the law; or through the Senate, which appears to intervene only in acute and extreme circumstances. Neither the State Inspectorate nor the Senate has any means of forcing another state body, particularly an influential ministry, to act in a certain manner.

Vertical coordination

The regional committees are required to report quarterly to the SCNP on their activities, including the implementation of their regional action plans. Regional departments also report to the corresponding state entity, such as the State Board for Environmental Certification, Standardization and Norms or the State Inspectorate for the Protection and Rational Use of Flora and Fauna and Nature Reserves.

The SCNP holds annual meetings in Tashkent with all of the regional committees, and it may convene similar meetings of special interest, as needed. In recent years, the voice of the regional committees has been strengthened in identifying priorities and preparing the PANP through a bottom-up process.

1.6 Conclusions and recommendations

The National Commission for Sustainable Development was abolished in 2005, and its policy functions were delegated to the Cabinet of Ministers. When the Commission was previously under the Vice Prime Minister, there was also an operational working group, with organizational and technical support from the Ministry of Economy. However, no such secretariat structure exists now. There is a department within the Cabinet of Ministers to which the functions have been delegated, but this is not set up to carry out the day-to-day technical work of a secretariat that is given the task of overseeing the implementation of the 1997 NSDS. At the same time, the SCNP has routine coordination functions for most of the policies and plans related to the NSDS.

Recommendation 1.1:

The Cabinet of Ministers should consider re-establishing the National Commission for Sustainable Development and designate the Ministry of Economy as its secretariat.

The 1997 NSDS is intended to function as an overarching framework for all other strategic and legal documents in Uzbekistan. In the 12 years since its adoption, it has not been reviewed or revised; neither does it contain a set of indicators to measure progress towards implementation. Some countries have carried out peer reviews of their own national strategies on sustainable development. This has proven to be an extremely useful tool for governments in revising and refining their national strategies on sustainable development and furthering their implementation.

Recommendation 1.2:

The Cabinet of Ministers, with the involvement of relevant ministries and agencies, should:

- (a) Carry out a peer review of the 1997 National Sustainable Development Strategy and amend it with indicators of, and procedures for, monitoring implementation;*
- (b) Review and renew the key documents that constitute the policy and legal framework in order to maintain their accordance with the National Sustainable Development Strategy.*

The National Environmental Action Plan was adopted in 1998 and has not undergone revision. Much has changed in Uzbekistan since then: the economic environment is quite different; the legal framework has moved forward; and some of the original objectives and targets for environmental protection have been accomplished. Recent major policy documents, such as the 2007 Privatization Programme for 2007–2010 and the 2007 Welfare Improvement Strategy for 2008–2010, need to be reflected in new environmental policy documents that would, among other things, clearly show how these strategies are linked to environmental protection.

Recommendation 1.3:

The State Committee for Nature Protection, in cooperation with relevant ministries and agencies, should prepare a comprehensive national environmental action plan taking into account the current social, economic and environmental situation and establishing new objectives and targets on this basis with concrete funding possibilities and the designation of relevant institutions.

The first EPR of Uzbekistan (2001) recognized the effort made by Parliament in establishing a good legal framework for environmental protection. At the same time, it noted some of the shortcomings resulting from reliance on largely normative laws,

including the need to ensure the timely enactment of government regulations.

Since 2001, Uzbekistan has been developing new and amended environment-related laws. Although the regulatory framework is also being developed, it is not unusual for the regulations required for implementation to lag behind the enactment of the law. An environmental code would help to consolidate environmental legislation. It could be developed in such a way as to ensure that: human health and the environment are protected against damage caused by pollutants or other impacts; valuable natural and cultural environments are protected and preserved; biological diversity is preserved; land, water and the physical environment in general are used so as to secure sound long-term management in ecological, social, cultural and economic terms; reuse and recycling are promoted; the management of materials, raw materials and energy take into account the need to establish and maintain natural cycles.

Recommendation 1.4:

The State Committee for Nature Protection and relevant ministries and agencies should consider preparing a draft environmental code that will establish the overriding principles of the law and set the full regulatory framework for implementation.

During the preparatory phase of the 2007 Welfare Improvement Strategy for 2008–2010, there were two interim documents: the Living Standards Improvement Strategy for the Population of Uzbekistan 2004–2006 and up to 2010 and the Welfare Improvement Strategy for 2005–2010: Interim Poverty Reduction Strategy Paper. Both of these documents were drafted with the broad participation of both the Government and civil society of Uzbekistan and contained a full section that dealt with environment protection as a necessary element for improving the quality of life. However, the finalization of the Welfare Improvement Strategy appears not to have involved full participation, and environmental issues were given much less emphasis. The Government has adopted the Welfare Improvement Strategy, which is considered to be one of the primary references for donors and the country's main development strategy.

Recommendation 1.5:

The Ministry of Economy together with the State Committee on Nature Protection should amend the Welfare Improvement Strategy to reflect adequately, among others, the National Sustainable Development Strategy and all relevant key environmental concerns.

Chapter 2

COMPLIANCE AND ENFORCEMENT MECHANISMS

2.1 Progress since the first Environmental Performance Review

State control by the competent public authorities, self-monitoring by enterprises and citizen monitoring as the main mechanisms to bring enterprises and individuals in Uzbekistan into compliance with the requirements of environmental law are identified in the 1992 Law on Nature Protection and other environmental and natural resources laws of Uzbekistan. During the reviewed period, the above mechanisms, as well as the relevant provisions of the environmental and natural resources laws, were not amended significantly.

Certain amendments to the laws on nature protection, air protection and forests were adopted in October 2006. They aimed to reduce the administrative burden of the business community by limiting the power of environmental enforcement authorities to suspend or cease activities, except in certain cases, for example, imminent or potential threats to human health or the environment. These amendments stipulate that environmental inspectorates may issue such an order for a period of up to 10 working days, while for longer periods it should be made only on the basis of a court decision. However, this sanction was used very rarely; for example, in 2007 the activities of only five facilities were suspended on the grounds of non-compliance with water legislation. However, the overall system of sanctions for administrative environmental offences established by the 1994 Administrative Responsibility Code have remained almost unchanged since the first review. At the same time, the 2001 amendments to the Criminal Code have reconsidered half of the articles establishing criminal sanctions for environmental offences. Criminal fines were considerably increased, the duration of sentences was reduced and the list of offences punishable by a prison sentence was shortened.

A number of amendments to the 1998 Law on the State Control of Activities of Economic Entities and the 2000 Law on Guarantees of Freedom of Economic

Activities to reduce the number of inspections of enterprises were adopted in 2001. These amendments have also been supported by the adoption of a range of regulations further detailing the rules regarding periodicity and prior approval, registration and the coordination of inspections (annex IV).

2.2 Environmental enforcement authorities

The 1992 Law on Nature Protection defines the following entities as environmental enforcement authorities:

- State Committee for Nature Protection (SCNP);
- Ministry of Health;
- Ministry of Agriculture and Water Management;
- State Inspectorate for Safety in the Manufacturing and Mining Industries and Municipal Sector;
- State Committee on Land Resources, Geodesy, Cartography and State Cadastre.

The competencies and main functions of inspectorates are defined by various laws and regulations adopted in certain spheres of compliance with environmental requirements. However, relevant provisions of the major laws on the environment and natural resources only specify the competent public authority and applicable type of control (state, industrial, public, departmental). At the same time, the Cabinet of Ministers approved a number of regulations that give limited responsibilities in some spheres of environmental enforcement to different ministries, committees and agencies. The issues of wildlife protection and subsoil use and protection, as well as the rational utilization of mineral resources, have been regulated in more detail.

In some cases, these issues are resolved by the adoption of joint orders by the enforcement authorities. For example, the 2003 orders of the General Prosecutor's Office and the SCNP determined instructions on the interaction between environmental inspectors and prosecutors, including in applying criminal responsibility for non-compliance with environmental requirements.

National Council for the Coordination of Enforcement and Control

Within the current institutional framework, the environmental authorities in Uzbekistan have rather limited power to promote a strategic approach to environmental enforcement. When the National Council for the Coordination of Enforcement and Control (NCCEC) was created in 1996, the issues of planning, coordinating the activities of different inspectorates and prioritizing control, inspection and enforcement activities were passed to this authority. The NCCEC has territorial commissions in the Republic of Karakalpakstan, all the regions and Tashkent City.

The NCCEC approves annual and quarterly schedules specifying the enterprises to be inspected and the enforcement authorities. The Council also authorizes non-scheduled inspections and exercises control over the activities of enforcement authorities in terms of compliance with the coordination plans of inspections. An important priority is a reduction in the number of inspections of economic entities and the development of measures for streamlining the system of inspections.

A negative consequence of this very centralized approach to inspections and enforcement is that regulators do not have explicit enforcement policies defining the purposes of environmental enforcement. In many cases, environmental inspectorates monitor compliance with environmental requirements and use available enforcement measures and sanctions without a clear vision of how their activities contribute to achieve better compliance with environmental law. The overall target of reducing the number of inspections is considered as the main performance indicator to assess the activities of the environmental enforcement authorities in Uzbekistan.

State Committee for Nature Protection

The SCNP remains the key environmental enforcement authority responsible for compliance with environmental requirements for the protection of ambient air, water and land resources, wildlife and subsoil. There is no autonomous institution or single subdivision within the structure of the SCNP to deal with prevention, monitoring and detection or to take action to correct non-compliance with environmental requirements. At the national level, these functions are carried by various subdivisions of the SCNP, including the State Specialized

Inspectorate for Analytical Control, the Department for Air Protection, the Department for Control over the Protection and Use of Land and Water Resources, the State Inspectorate for the Protection and Rational Use of Flora, Fauna and Nature Reserves. At the local level (regions and Tashkent City), the composition of environmental inspectorates may vary from region to region. For instance, the Committee for Nature Protection in the Bukhara region includes the following inspectorates:

- Inspectorate for the Protection of Flora and Fauna;
- Inspectorate for Mineral Resources, Waste and Soil Contamination;
- Inspectorate for the Protection and Rational Use of Water Resources;
- Inspectorate for Air Protection; and
- Specialized Inspectorate for Analytical Control.

Most employees in territorial departments of the SCNP are environmental inspectors. For example, about 80 of the 120 staff members at the Samarkand territorial committee are inspectors. Despite frequent staff reductions in public authorities, no essential changes have been made to the number of SCNP inspectors since 2001. However, the country lacks a system for training specialized personnel in educational institutions to improve the potential development of environmental inspectorates. In recent years, the SCNP has not conducted educational courses; nor has it published information or methodological guidelines on environmental enforcement for inspectors. However, as part of the Programme of Actions on Nature Protection for 2008–2012, such training is planned for SCNP employees with regard to the study of legislative regulations, the application of sanctions for their violation, and the standardization of inspection reports. The SCNP and the Ministry of Internal Affairs have been appointed the responsible agencies.

Table 2.1 shows that the application of administrative penalties is far more common than that of criminal penalties. Cases initiated in accordance with a criminal procedure rarely result in the defendant being held liable or in a criminal sentence being imposed. Furthermore, the sanctioning system does not deal with the criminal liability of legal persons. Traditionally, the system is more reliant on criminal prosecutions with regard to violations of the requirements concerning the protection and use of flora and fauna, the perpetrators of which are easier to identify. Another important aspect of environmental enforcement is the gradual increase in the number of

Table 2.1: Administrative and criminal enforcement by the State Committee for Nature Protection, 2001–2007

Year/Sector	2001	2002	2003	2004	2005	2006	2007
Ambient air							
Administrative offence cases	1,817	2,472	2,694	2,272	2,550	2,293	3,164
Fines levied (thousand sum)	8,931	16,331	22,800	25,728	39,546	41,493	76,941
Criminal offence cases	..	..	..	..	..	..	..
Water							
Administrative offence cases	1,998	2,310	2,644	2,307	2,350 *	2,350 *	3,031
Fines levied (thousand sum)	7,225	12,347	17,600	15,871	20,000 *	18,000 *	31,200
Criminal offence cases	..	..	..	..	..	..	..
Industrial waste							
Administrative offence cases	787	751	922	848	892	820	1,178
Fines levied (thousand sum)	2,899	4,712	7,742	7,205	9,505	12,438	21,218
Criminal offence cases	..	..	..	..	..	..	..
Domestic waste							
Administrative offence cases	795	834	1,201	1,283	1,447	1,573	2,391
Fines levied (thousand sum)	2,270	3,549	5,828	7,548	10,004	12,189	26,767
Criminal offence cases	..	..	..	..	..	..	..
Nature conservation							
Administrative offence cases	4,367	4,149	4,441	3,879	4,372	6,119	7,277
Fines levied (thousand sum)	11,064	15,461	22,300	20,052	25,325	46,436	73,499
Criminal offence cases	16	17	21	46	..	..	..

Source: *Environmental Situation and Utilization of Natural Resources in Uzbekistan: Facts and Figures 2000–2004*, State Committee on Statistics and United Nations Development Programme (UNDP) in Uzbekistan, Tashkent, 2004; *National Report on the Environmental Situation and Utilization of Natural Resources in Uzbekistan*, SCNP and UNDP in Uzbekistan, Tashkent, 2009.

Note: * Approximately.

established cases of non-compliance and the amount of fines for non-compliance with requirements relating to ambient air, water, industrial and domestic waste and nature conservation, despite the reduction in scheduled and non-scheduled inspections by the environmental enforcement authorities.

Ministry of Health

Within the Ministry of Health, issues of environmental enforcement are dealt with by the Sanitary and Epidemiological Supervision Department and the National Centre for State Sanitary and Epidemiological Supervision. Employees of the latter exercise control over compliance with sanitary and hygiene standards and requirements for ambient air protection and radiation safety and noise exposure standards from transport and other technical means. The role of this authority in environmental enforcement is still very significant because many environmental quality standards in Uzbekistan are sanitary and hygiene standards.

Ministry of Agriculture and Water Management

Within the Ministry of Agriculture and Water Management, environmental enforcement issues are dealt with by the following bodies:

- Water: by the Water Inspectorate of the Water Management Department and territorial departments of agriculture and water resources; and
- Protected natural areas: by the Forestry Management Department (Division for Nature Reserves, National Parks and Forestry, Section of Forestry and State Control of State of Forests) and the administrations of protected natural areas.

This Ministry deals with most of the specially protected natural areas and forests; however, its officials are not entitled to apply administrative sanctions for wildlife-related offences. They can only detain and deliver offenders to the SCNP flora and fauna protection inspectorates or to internal affairs

authorities. The functions of the Water Inspectorate are basically related to monitoring compliance with water use limitations and ensuring environmental safety in the operation of hydraulic structures¹.

State Inspectorate for Safety in the Manufacturing and Mining Industries and Municipal Sector

The State Inspectorate for Safety in the Manufacturing and Mining Industries and Municipal Sector consists of two state inspectorates: (1) an inspectorate on subsoil protection, mineral raw material processing and geological survey control; and (2) an inspectorate on the oil and gas industry. The role of inspectors in this field is performed by the managers and leading experts of territorial departments of state mining supervision authorities. The Inspectorate, together with the SCNP, deals with the issues of state control of compliance with subsoil use and protection, including the necessary licences and compliance with the terms contained in licences or production sharing agreements.

State Committee on Land Resources, Geodesy, Cartography and State Cadastre

The State Committee on Land Resources, Geodesy, Cartography and State Cadastre exercises control over the protection and rational use of land. It also ensures that measures are taken to stop violations and bring their perpetrators to account. At the central office, these issues are dealt with by the Department for the Control of Land Use and Protection (two employees). At the local level, these functions are performed by sections on the control of land use and protection of the Department for Land Resources and State Cadastre of the Republic of Karakalpakstan, the regions and Tashkent City. However, the role of this authority in environmental enforcement is rather restricted because the issues of land contamination with industrial and other wastes, chemicals and radioactive substances and waste waters are referred to the competence of the SCNP.

Other authorities dealing with environmental enforcement

In addition to the authorities mentioned above, prosecutors also fulfil certain functions in the area of environmental enforcement in Uzbekistan. However,

a specialized environmental prosecutor's office was established only in the Autonomous Republic of Karakalpakstan. Judges specialized in administrative cases in local (rayon – district, town) courts are entitled to review cases on certain administrative environmental offences, particularly illegal fishing and hunting and the illegal treatment of rare and endangered species. In general, the system of environmental enforcement authorities has not been changed significantly since the first Environmental Performance Review (EPR).

2.3 Assessment tools, including environmental impact assessment, strategic environmental assessment, state ecological expertise and environmental audits

In view of implementing the 2000 Law on State Ecological Expertise, in December 2001 the Cabinet of Ministers approved the Regulations on State Ecological Expertise and a list of facilities subject to expertise. The adoption of this government resolution contributed to the further promotion of environmental impact assessment (EIA) and state ecological expertise (SEE) instruments. Thus, while in the early 2000s SEE procedures were annually conducted on 4,000–5,000 facilities in Uzbekistan, in 2007 and 2008 they were conducted on approximately 12,000 facilities.

The facilities subjected to SEE and EIA procedures come under four categories of environmental impact: category I – high risk; category II – medium risk; category III – low risk; and category IV – local impact. The requirements and terms of SEE and EIA differ according to the category of a facility. However, the list of facilities subject to EIA and their division into four categories are not compatible with similar lists of projects subject to EIA under the European Union Directive concerning environmental impact assessment² or the Convention on Environmental Impact Assessment in a Transboundary Context.

An EIA is a mandatory procedure that precedes an SEE on the planned activity. Depending on the category of the facility, the full procedure can include up to three stages, as follows:

1. A preliminary review of the environmental impact conducted at the initial design stage, normally before a construction site is selected and before the facility is financed.

¹ Hydraulic structures refer to any devices that can be used to divert, restrict, stop, or otherwise manage the natural flow of water.

² Council Directive of 27 June 1985 on the assessment of the effects of certain public and private projects on the environment (85/337/EEC).

2. A review of the environmental impact which is prepared prior to the approval of a project feasibility study.
3. A review of the environmental consequences conducted prior to the commissioning of a facility.

The Regulations on State Ecological Expertise contain references to public hearings as part of the EIA procedure, when necessary. Essentially, this issue has been referred to the discretionary power of the SEE authority and the developer. On the whole, the procedure concerning public participation in EIA has not yet been properly regulated, for example it provides the discretionary power to hold public hearings when this is necessary. In practice, the SEE authority usually needs to hold consultations with the public if there are disagreements and complaints from the population with regard to the planned activity. Thus, the public participation requirements are often applied to small facilities planned to be located close to populations. Also, it should be noted that compliance with the requirements for public participation in EIA in many regions is resolved through local self-governance committees (makhallia).

The SEE instrument is applied in relation to projects and existing industrial facilities. For currently operating facilities, the documents establishing emission level values are provided for the expertise (draft emission limit values on pollutants released into the ambient air, discharge limit values on pollutants released into surface water bodies and the ground, waste generation and disposal limits). Depending on the category of the project, the SEE is conducted either by the Department for State Ecological Expertise of the SCNP (categories I and II) or by the territorial committees for nature protection of the relevant region, the Republic of Karakalpakstan or Tashkent City (categories III and IV).

The public ecological expertise (PEE) and environmental audit instruments that are also stipulated by the Law on State Ecological Expertise and the Regulations on State Ecological Expertise have not been developed. PEE may be implemented at the initiative of non-governmental non-profit organizations or citizens. However, it is not implemented in practice because it is costly and has just an advisory role. A few independent environmental audits, based on international practices, were conducted, mostly by foreign enterprises, for

example when projects are financed by international financial institutions.

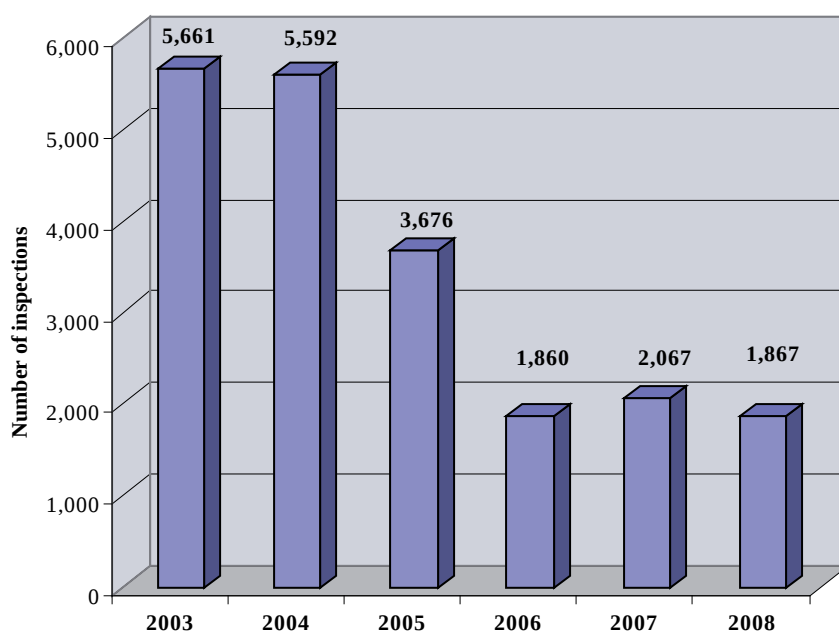
The strategic environmental assessment instrument is not promoted in Uzbekistan. However, according to the Law on State Ecological Expertise and the Regulations on State Ecological Expertise, an SEE is mandatory for draft state programmes and concepts as well as town planning documentation at the design stage of facilities for a population size of over 50,000 people.

2.4 Environmental permits

Environmental permits include emission limit values that are developed separately for ambient air, water bodies and waste. Emission limit values are approved by the SCNP on the basis of the SEE. For planned activities that are subjected to an SEE, a positive opinion given in the EIA report is the equivalent of an environmental permit.

The terms and procedures for reviewing and approving emission limit values for substances emitted into the ambient air and water bodies, as well as waste disposal limits, are determined in compliance with the requirements of SEE procedures and by the allocation of competences on the approval of emission limit values by the SCNP Department for State Ecological Expertise for categories I and II and by the territorial committees for nature protection of a region, the Republic of Karakalpakstan or Tashkent City for categories III and IV. Waste disposal limits are approved for five years, and the standards of emission limit values for enterprises of categories I, II, III and discharge limit values for substances emitted into water bodies for any enterprise are approved for three years. Emission permits are not based on an integrated approach to pollution prevention and control. Calculations of the standards of air emissions, discharge into water bodies and disposable wastes are based on different approaches. Standards are approved for different terms, and two different departments of the SCNP exercise control over their compliance (the Department for Air Protection and the Department for Control over the Protection and Use of Land and Water Resources, as well as specialized inspectorates for analytical control).

Technique-based indicators of three levels are used as a basis for the calculation of discharge limit values, but not the maximum allowable concentration

Figure 2.1: Scheduled inspections by the State Committee for Nature Protection, 2003–2008

Source: Monthly schedules of inspections for 2003–2008 presented in the Uzbek Norma legislation database.

Note: These figures are the author's calculations based on monthly lists of enterprises planned to be inspected which are disaggregated per 12 regions, the Republic of Karakalpakstan and Tashkent City.

(MAC) indicators. The performance indicators can be achieved under the following conditions:

- The optimal operation of treatment facilities available at the facility;
- The use of the best available technologies; and
- The application of the most effective treatment technology that approaches the MAC standards.

This is a step towards standardizing discharge on the basis of achievable target indicators stipulated by the European Union Water Framework Directive³. The approval of discharge limit values is integrated in a water use and abstraction permit that is issued by the SCNP. The water permit system has not been changed since the first EPR of Uzbekistan. There is no detailed regulation on the issuance procedure of water permits, despite the fact that the Cabinet of Ministers should adopt such a measure in accordance with the 1993 Law on Water and Water Use. Therefore, the issuance of water permits is still based on very short provisions of the Law on Water and Water Use and the Law on Nature Protection.

³ Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for Community action in the field of water policy.

2.5 Compliance assurance: monitoring and reporting

Two types of monitoring and reporting are currently in use in Uzbekistan to ensure that the regulated community complies with environmental requirements based on the following:

1. Inspections of enterprises and nature users and enforcement by various environmental inspectorates.
2. Monitoring of emissions by specialized inspectorates for analytical control.

Inspection procedures are governed by the provisions of the 1994 Administrative Responsibility Code and some regulations adopted by the Cabinet of Ministers or the SCNP. During the reviewed period, the Government pursued an active policy of reducing administrative obstacles for enterprise development, which resulted in restrictions with regard to the use of the instrument and a significant reduction in the number of scheduled and non-scheduled inspections. Currently, any scheduled inspections of entities and individual entrepreneurs in the country may be held only according to the schedules approved

Box 2.1: Public awareness of scheduled inspections

For the purposes of increasing public awareness, the public has access to the documents on scheduled inspections of the business community. In particular, inspection schedules of economic entities and individual entrepreneurs are published in a newspaper, Tax and Customs Newsletter, which is placed in the Norma informational and legal database and other mass media. The Ministry of Justice, with the support of the project by the International Finance Corporation and the State Secretariat for Economic Affairs of Switzerland, has prepared a detailed instruction sheet on inspections conducted by the enforcement authorities

by the NCCEC, namely provided that the schedule has been entered into the schedule and within an agreed period of time. The inspection procedure is becoming increasingly regulated and the number of bans and restrictions specified are gradually increasing for public enforcement authorities. Thus, the periodicity of inspections for compliance with environmental requirements for private enterprises has now been reduced from once a year to once every two years, and for state enterprises an inspection may be held not more than once a year. The duration of an inspection should not normally exceed 30 calendar days, and only in exceptional cases, as decided by the NCCEC, may it be extended for an additional term not exceeding 30 calendar days. The 2008 Anti-recessionary Programme provides for a further reduction in compliance inspections in 2009, including a 30 per cent reduction in scheduled inspections (figure 2.1). In addition, it is important to mention that there is a good level of awareness within the regulated community of the existing procedures of compliance inspections by public enforcement authorities, and of the rights and responsibilities of inspectors (box 2.1).

During the reviewed period, Uzbekistan also restricted the possibilities of non-scheduled inspections of enterprises' compliance with environmental requirements. They may be held only as decided by the NCCEC or its territorial commissions in the event of the following:

- A need for inspections arising from presidential decrees and government resolutions;
- The receipt by a public enforcement authority of well-grounded allegations, which are confirmed by documents, of violations of legislation by an economic entity;
- Emergency prevention;
- The aggravation of a sanitary and epidemiological situation and the probability of infectious diseases being imported from a neighbouring country and disseminated.

The goal of decreasing the number of inspections, including non-scheduled ones, is related to reducing the abuse of power by enforcement authorities in terms of business activities. However, it makes the process of compliance monitoring and enforcement more complicated for environmental inspectors, in particular the possibilities of identifying cases of environmental non-compliance, because the enterprises concerned are fully aware of scheduled inspections and are therefore able to hide evidence of environmental violations.

However, the data presented in table 2.1 indicate the gradual increase in the established cases of non-compliance, despite the reduction in scheduled and non-scheduled inspections by environmental enforcement authorities. Thus, it is difficult to say that reducing the number of inspections significantly affects environmental compliance.

In fact, with the significant reduction in inspections of enterprises and individual entrepreneurs, the importance of monitoring environmental emissions in Uzbekistan has increased. Such monitoring is conducted by the State Specialized Inspectorate for Analytical Control of the SCNP and the Sanitary and Epidemiological Supervision Department of the Ministry of Health. In accordance with the 2006 Regulation on the Procedure of Conducting Checks of Economic Entities and the Registration of Checks, the monitoring of pollution sources is not covered by the requirements of the inspection procedure. Since 1999, Uzbekistan has had a programme for monitoring the sources of environmental pollution. According to the Programme for Monitoring the Environment for 2006–2010, it should be based on the list of priority facilities defined by the State Specialized Inspectorate for Analytical Control. The relevant legislation is not very specific or detailed. In practice, a list of facilities where the monitoring of such pollution sources is held should be agreed upon with the NCCEC. Thus, the public authorities may from time to time take

samples of pollutant emissions and discharge being released into the environment at the pollution sources of industrial enterprises, in soil, waste and surface waters. The detection of pollutant levels that exceed the established emission standards when such samples area analysed often serves as a basis for subsequent inspections and for bringing perpetrators to account according to the procedures established by law. Issues related to environmental monitoring are discussed in more detail in chapter 3.

Inspections of the compliance of mobile sources of pollution with a limited number of environmental requirements are conducted in Uzbekistan. For example, the monitoring of motor vehicles for toxic substances and exhaust smoke capacity and the control of some practices in agriculture and construction, such as the prevention of burning stubble-fields, which causes a deterioration in soil fertility and ambient air pollution, and the heating up of bitumen. Neither are such inspections included in the requirements of the procedures for inspecting legal entities and individual entrepreneurs. The “Clean Air” campaign is held twice a year and includes checking vehicle emissions for toxicity as well as an evaluation of the environmental status of motor transport enterprises, service stations, maintenance stations and car repair plants. In general, this inspection annually covers about 40 to 48 per cent of motor vehicles registered in the country.

Compliance with environmental requirements concerning wildlife and specially protected natural areas has, as before, been built on the basis of guard and patrol inspections of the relevant natural areas. They also do not fall under the requirements of the inspection procedure, and in general the law enforcement mechanism in this sphere has practically not changed since the first EPR was conducted. In this respect, the 2004 Law on Protected Natural Areas, the SCNP 2006 Rules for Hunting and Fishing and the 2008 Regulation for Forest Protection adopted during the reviewed period have only resulted in more detailed regulation and an increase in the number of environmental requirements with regard to specially protected natural areas, forests and hunting and fishing areas, basically without touching upon the approach to their enforcement. Despite the adoption of these regulatory documents, Uzbekistan did not revise the administrative and criminal sanctions for violations of wildlife protection requirements set forth in the Administrative Responsibility Code and the Criminal Code, respectively.

The mechanism of citizen monitoring of environmental offences and enforcement is implemented in Uzbekistan first of all through the development of a public environmental inspectors’ institute. Such status may be granted by the SCNP or its territorial departments to Uzbek citizens, who are nominated by non-governmental organizations (NGOs) or other organizations. Public environmental inspectors are vested with a number of environmental enforcement rights as part of the SCNP 2000 Regulation on Public Environmental Inspectors and the Administrative Responsibility Code. However, the practical application of this mechanism is rarely used and a very limited number of citizens have been granted public environmental inspector status. The SCNP considers public participation in environmental enforcement as the periodic involvement of civil society in inspections carried out by the competent public authorities.

Also, the possibilities for public appeals against relevant decisions and actions of the state authorities through administrative or judicial proceedings are set forth in the 2002 Town Planning Code.

Data on compliance monitoring and enforcement derived from inspections are collected through the statistical form “Environment – 1”. Although data are available for various SCNP inspections, they are not publicly available. Only fragmented data on the number of offences and amounts of administrative fines levied were made publicly available through the national reports on the state of the environment published in 2005 and 2008. Also, environmental enforcement authorities rarely use proactive approaches like information campaigns, training activities or implementation guidelines to inform the regulated community of new laws and regulations and their practical application, or to provide guidance on the best available techniques. Data on monitoring the polluting substances emitted by industrial facilities are collected and stored in three different databases (on ambient air, water and waste) maintained by the State Specialized Inspectorate for Analytical Control.

2.6 Promotion of environmental management systems at enterprises

Quite recently Uzbekistan started to undertake a very limited number of compliance promotion activities. From 2003 to 2005, the State Board for Environmental Certification, Standardization and Norms of the SCNP adopted a number of documents on the eco-certification of production and services.



Historic part of Samarkand

However, in practice, eco-certification deals with a very limited number of products falling under certain international and national regimes, namely the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal and European Union regulations on emission limits for diesel and gasoline vehicles. Eco-certificates are mainly issued for the export and import of such products.

Uzbekistan made some progress in promoting environmental management systems (EMS) at enterprises. In 2002, Uzstandard (the Agency for Standardization, Metrology and Certification of Uzbekistan) adopted the national standards on EMS based on ISO 14001 and 14004. Eight enterprises are accredited as certification bodies for ISO 9001 and 14001. According to Uzstandard, six Uzbek enterprises have acquired ISO 14001 EMS certification and 195 enterprises are currently ISO 9001 certified.

There is a lack of progress in the area of promoting better compliance through making information on the environmental performance of industries known to a broader public. Not only does this concern such advanced instruments as the Pollutant Release and Transfer Registers or eco-certification on ecotourism or sustainable tourism; even the existing basic information derived from monitoring, inspections and

enforcement is not accessible to the general public on a regular basis.

2.7 Environmental legislation enforcement tools

Uzbek legislation provides three different types of responses to non-compliance with environmental requirements, as follows:

- Administrative measures, which can include a range of approaches from “soft” measures, such as advice and warnings, to “harder” measures, such as fines or facility closure;
- Criminal sanctions, which are usually limited to serious offences or when administrative measures have been ineffective;
- Civil measures, which include monetary compensation for the damage caused and are applied by the courts.

The review of cases in the administrative procedure is the most effective in terms of its duration and is the least costly both for the public authorities and the regulated community. The orders regarding environmental administrative offences are rarely appealed against in practice. With regard to administrative environmental offences, the enforcement authorities have at their disposal the following set of enforcement tools: administrative fines; the suspension of facility operations;

Box 2.2: Methodological documents on emission standards adopted in 2004–2006

- Procedure for the development and arrangement of draft limit values for the discharge of pollutants into water bodies and the ground according to technically achievable indicators of waste water treatment (O'z RH 84.3.5:2004)
- Instructions on setting limit values for the discharge of pollutants into water bodies and the ground according to technically achievable indicators of waste water treatment (O'z RH 84.3.6:2004)
- Methodological instructions for the calculation of the limit values for the discharge of pollutants into water bodies and the ground according to technically achievable indicators of waste water treatment (O'z RH 84.3.7:2004)
- Organization and procedure of project development on production and consumption waste disposal limits (O'z RH 84.3.17:2005)
- Instructions on making inventories of pollution sources and setting air emission limits for the enterprises of the Republic of Uzbekistan, 2006

confiscation of the item that served as an instrument or direct object of the administrative offence; and the withdrawal of the right to hunt for a certain period. The most frequently used enforcement tool is the administrative fine, which may vary for an environmental offence from one tenth to 10 minimum monthly wages. The above levels of fines for administrative offences established by the Administrative Responsibility Code are not considered to provide the necessary deterrent to prevent further non-compliance. Two significant changes in the system of administrative sanctions for non-compliance with environmental laws have taken place since the first EPR of Uzbekistan. First, a new part was incorporated into Article 88 of the Administrative Responsibility Code which establishes the liability for burning stubble-fields, dry leaves and tree branches or other plant residues on fields which causes soil degradation and ambient air pollution with hazardous substances. Second, the suspension of facility operations was limited during the reviewed period, namely in 2006.

A range of sanctions is available for criminal environmental offences, namely fines, the withdrawal of a certain right, correctional labour, arrest and imprisonment. However, criminal sanctions are very rarely used to punish environmental offences. In 2001, the criminal sanctions of half the articles on environmental offences contained in the Criminal Code were revised in the context of humanizing criminal liability, namely, the terms of criminal sanctions in the form of imprisonment were reduced, and the number of penalties applied for relevant offences were increased. Fines are now the most commonly used criminal sanctions.

Civil enforcement measures are applied for administrative or criminal environmental offences. Only a small percentage of cases go to the courts for compensation for damage caused by a violation of

environmental law. For example, in 2007 only 11.57 million sum was levied as compensation for violations of water discharge limits through 92 lawsuits. In most cases, compensation for environmental damage identified by environmental inspectorates is paid by enterprises on a voluntary basis.

2.8 Emission and ambient standards and their enforcement

Most environmental quality standards in Uzbekistan are still MACs approved by the Ministry of Health. They are one of the main bases for establishing emission level values and issuing environmental permits. MAC standards on water and soil are basically the same quality standards that were used during the soviet era, while some of those related to ambient air have been reconsidered (MACs on ambient air for human settlements (SanPiN N 0179-04) and environmental air quality standards, for example on nitrogen dioxide).

Since the first EPR, the SCNP has adopted a number of important methodological documents concerning calculations and setting emission limit values for pollutants.

The documents mentioned in box 2.2 provide guidance for enterprises on how to estimate emission limit values for air emissions, water discharges and waste disposal and define the procedures for their approval by the SCNP. Approved emission standards for ambient air are valid for three and five years (new and modernized enterprises of categories I–III), and for five years for waste disposal. The documents on water discharges mentioned in box 2.2 promote the new technique-based approach to setting emission standards. This approach aims to ensure the application of the best available techniques for reducing the environmental impact of discharges and to achieve MACs gradually based on the assimilative

capacity of the receiving water body. For waste disposal, the reviewed methodical document is limited to setting limits for temporary disposal and the environmentally sound management of waste at production sites. The document does not deal with waste recycling and reuse, transportation, incineration or final disposal at special sites and polygons. The regulation of water discharge standards appears to be the most developed in Uzbekistan; however, it is premature to assess the implementation of this approach in the country.

In practice, a large number of pollutants that are covered by emission standards are not actually monitored by facilities. The charges for exceeding emission level limits are considered as tools to ensure compliance with these limits. However, the established charges for air pollutant emissions, as well as administrative fines for non-compliance with environmental requirements, are considered too low to influence the behaviour of polluting enterprises, particularly with regard to air emissions.

2.9 Conclusions and recommendations

The principal attitudes and approaches to environmental compliance and enforcement, as well as the package of environmental policy instruments used in Uzbekistan, have not significantly changed since the first EPR of the country.

One of the specific features of the environmental enforcement system in Uzbekistan is a very centralized approach to the planning, regulation and monitoring of inspections by the NCCEC. The prevailing general approach promoted by the NCCEC is to reduce the burden on enterprises in Uzbekistan by cutting down the number of environmental inspections. This has a number of positive consequences for the business community and provides a better regulatory regime for operations in the country. However, this also leads to a situation where the enforcement authorities apply environmental law rather inconsistently and chaotically without a clear and consistent strategic vision of how to ensure compliance with and the enforcement of environmental requirements. The continual reduction in the number of inspections could not be considered as the main performance indicator to assess the effectiveness and efficiency of environmental compliance and enforcement mechanisms. This reduction will not result in the improvement of environmental conditions or the achievement of sustainable development goals.

Recommendation 2.1:

The State Committee for Nature Protection, together with relevant bodies, should:

- (a) Develop a strategy on environmental enforcement that defines objectives and priorities, appropriate time frames and performance indicators ensuring compliance with and the enforcement of environmental requirements;*
- (b) Ensure the capacity-building activities necessary for the effective implementation of the strategy at relevant administrative levels.*

The range of environmental policy instruments, for example environmental audits or public participation requirements in the environmental impact assessment procedure, is not used or advocated because of unclear legal provisions. While such an approach is often considered as a means to speed up the effective use of some new and progressive instruments in the country, it has some serious shortcomings. The lack of knowledge of these instruments and requirements by government regulators and the regulated community alike may complicate their effective implementation. Also, it may cause serious regulatory conflicts, lead to legal discrepancies and even to possible problems of corruption. Strategic environmental assessments are not promoted at all, although, according to current legislation, it is compulsory to carry out state ecological expertise for draft state programmes and concepts.

Recommendation 2.2:

The State Committee for Nature Protection should:

- (a) Draft by-laws on environmental policy instruments, such as environmental audits, environmental impact assessments and strategic environmental assessments;*
- (b) Promote their practical application through detailed implementation plans and guidelines.*

Public availability of reports (reviews, summaries) on inspection and enforcement activities in environmental protection and the use of natural resources is an important aspect of the transparency and public accountability of the environmental enforcement authorities. Furthermore, the reports are a source of valuable data and information of major interest for citizens and NGOs in terms of the public environmental control over industries and the use of enforcement mechanisms regarding the offences detected.

Recommendation 2.3:

The State Committee for Nature Protection, together

with relevant bodies, should:

- (a) *Ensure public access to the relevant data, such as reviews and summaries, on inspection and enforcement activities in environmental protection and the use of natural resources;*
- (b) *Update these data regularly.*

Uzbekistan uses administrative fines, in essence, as the only available administrative penalty and, to a greater extent, as the only sanction for non-compliance with environmental law. Such a situation does not allow for assessing the efficiency and effectiveness of fines as an enforcement tool. They do not act as a deterrent to prevent further non-compliance with environmental requirements. In this context, it is also useful to review the issue of penalties for repeated and regular administrative offences, because the available options of suspending or terminating activities involve major restrictive economic factors.

Recommendation 2.4:

The State Committee for Nature Protection should review the efficiency and effectiveness of the current use of administrative sanctions for environmental offences and consider possibilities to strengthen them in cases of repeated or systemic violations of environmental legislation.

EIA and the issuance of environmental permits are already a part of national legislation and key instruments of environmental policy already actively used in Uzbekistan. However, in many areas they

are not harmonized with relevant legal instruments of the United Nations Economic Commission for Europe (UNECE) and the European Union, such as the UNECE Espoo Convention⁴, the European Union Directive on EIA⁵, and the UNECE Aarhus Convention⁶. This is particularly the case for the list of activities subject to EIA and stages of the EIA procedure, as well as public participation in environmental decision-making. Further delays in the ratification of the above UNECE conventions may increase inconsistencies in the implementation of the above instruments of environmental policy in Uzbekistan with the relevant international good practices (chapter 4).

Recommendation 2.5:

In order to harmonize the instruments of environmental impact assessment and public participation with the relevant UNECE instruments, the Cabinet of Ministers should:

- (a) *Speed up the process of ratification of the Convention on Environmental Impact Assessment in a Transboundary Context (Espoo Convention), the Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters (Aarhus Convention) and the Kiev Protocol on Pollutant Release and Transfer Registers of the Aarhus Convention;*
- (b) *Establish a detailed legal and regulatory framework to ensure the full implementation of these instruments.*

⁴ Convention on Environmental Impact Assessment in a Transboundary Context.

⁵ See footnote 2.

⁶ Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters.

Chapter 3

MONITORING, INFORMATION, PUBLIC PARTICIPATION AND EDUCATION

3.1 Introduction

The first Environmental Performance Review (EPR) of Uzbekistan (2001) emphasized the need to reorganize and strengthen the monitoring network in the country, specifically in terms of the collection, processing and dissemination of data, so as to provide the necessary information for decision makers and the general public. In particular, it recommended that Uzbekistan improve its technical capacities for evaluating air pollution; establish a cost-effective biodiversity monitoring system; develop centralized databases for groundwater; and train monitoring and data management experts. To ensure public participation in all aspects of environmental protection, the first EPR recommended that the State Committee for Nature Protection (SCNP) initiate cooperation with non-governmental organizations and increase public participation in protected area management.

Uzbekistan has made some progress in the above-mentioned areas since the first EPR. However, much still needs to be done by the Government and specific public authorities to make environmental monitoring an effective information and policy tool, to promote public participation in decision-making and to introduce the sustainable development principle into education and training at various levels.

3.2 Environmental monitoring

Ambient quality monitoring

The Centre of Hydrometeorological Service (Uzhydromet) under the Cabinet of Ministers, together with its thirteen territorial departments, is the main public authority that carries out air quality, surface water quality, soil and radioactivity monitoring in the country. The 2004 Cabinet of Ministers Resolution on the Improvement of the Hydrometeorological Service of the Republic of Uzbekistan has raised the profile of ambient environment monitoring to some extent and made the

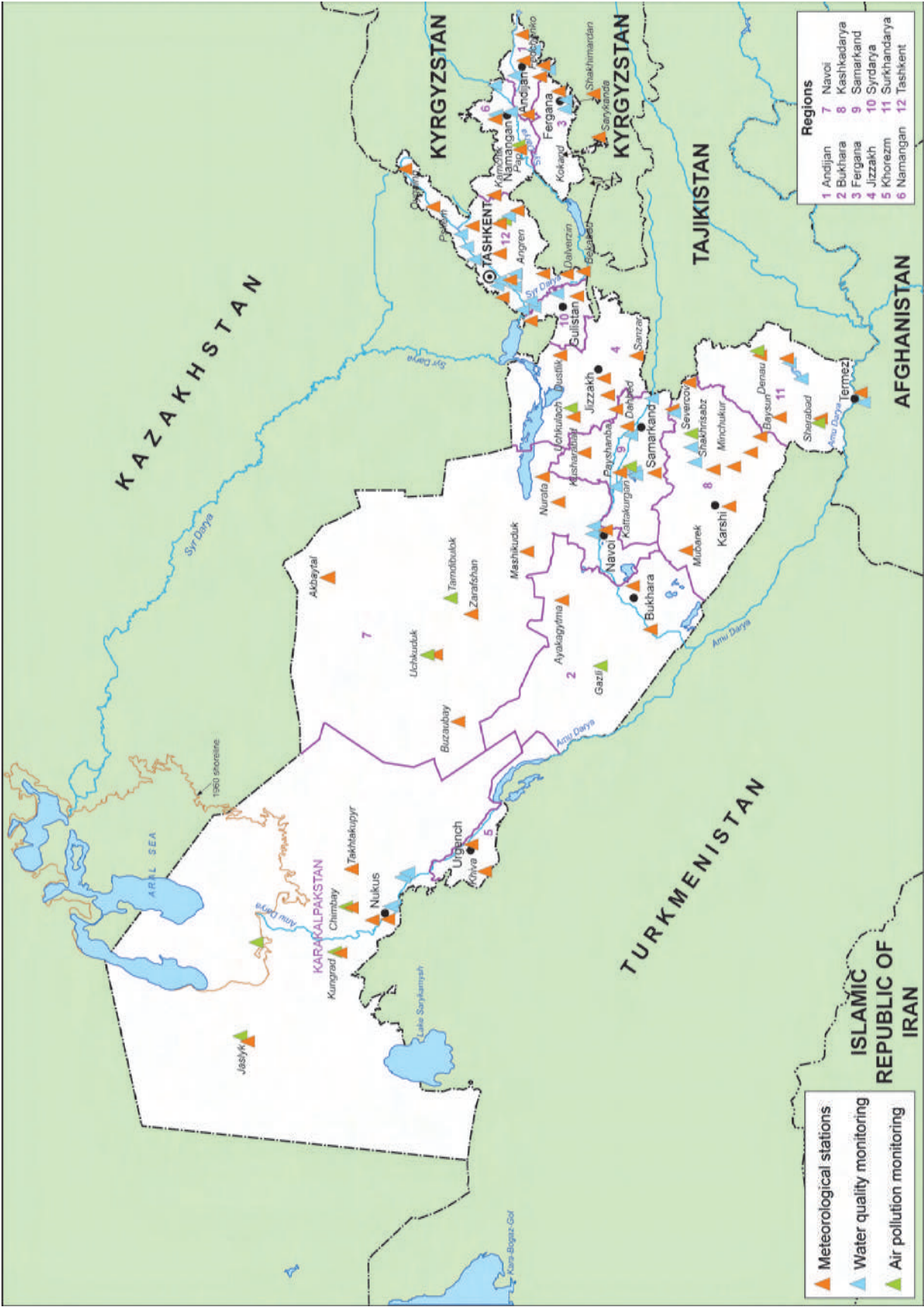
functions of the Uzhydromet Pollution Monitoring Service more specific. Its monitoring networks have not been expanded, and in some areas have even been reduced since 2001 (table 3.1. and map 3.1).

Air quality monitoring

Air quality monitoring discontinued in two small (non-industrial) cities in 2002 owing to a lack of funds. Uzhydromet currently monitors air quality at 66 fixed monitoring stations in 25 cities in the country. The number of mobile laboratories has decreased by 36 per cent since 2002. The network density is lower than the requirements of national monitoring regulations (one station per 50,000–100,000 city dwellers). Uzhydromet considers it necessary to install, as a priority, nine additional fixed monitoring stations: five stations in Tashkent, three in Jizzakh and one in Namangan in proportion with the population, industry and transport growth in these cities.

As a rule, the monitoring programme covers five pollutants: dust (total suspended particulates – TSP), carbon monoxide (CO), nitrogen dioxide (NO₂), sulphur dioxide (SO₂) and nitrogen monoxide (NO). Other parameters are added to the measurement programme depending on the polluting industries and the characteristics of nearby cities and the surrounding areas. Ground-level ozone is measured in eight cities. In total, 16 gaseous substances, benzo(a)pyrenes and 6 heavy metals are monitored in Uzbekistan. Air concentrations of a number of other pollutants identified by the international community as the most harmful to human health and the environment – fine particulates (PM_{2.5} and PM₁₀), volatile organic compounds (except benzo(a)pyrene), polycyclic aromatic hydrocarbons (PAH) and persistent organic pollutants (POPs) – are not measured in Uzbekistan. Measurements of PM_{2.5} and PM₁₀ were started in 2009 in Karakalpakstan under a pilot project managed by Uzhydromet and the Ministry of Health.

Map 3.1: Monitoring



Source: Environmental Profile of Uzbekistan 2008 Based on Indicators, United Nations Development Programme, 2008.
Note: The boundaries and names shown on this map do not imply official endorsement or acceptance by the United Nations.

Table 3.1: Environmental monitoring networks, 2001–2008

Network	2001	2002	2003	2004	2005	2006	2007	2008
Air quality monitoring								
Cities covered by monitoring	27	27	26	24	25	25	25	25
Fixed monitoring stations	69	69	68	65	67	66	66	66
Mobile monitoring laboratories	11	11	9	9	8	8	6	7
Background monitoring stations	1	1	1	1	1	1	1	1
Transboundary monitoring stations	3	3	3	3	3	3	3	3
Monitoring of atmospheric precipitation	14	14	14	14	14	14	13	13
Monitoring of surface water quality								
Water observation points	89	83	84	86	86	86	87	87
Water bodies covered by hydrochemical measurements	61	59	58	58	58	58	61	61
Water bodies covered by hydrobiological measurements	15	15	14	10	10	10	14	10
Background monitoring stations	6	5	5	5	5	5	5	5
Groundwater monitoring points	1,860	..	..	..	..	..	..	1,074
Soil quality monitoring								
Cities where heavy metals in soil are monitored	14	14	14	14	14	14	14	14
Farms where persistent organic pollutants are monitored	255	258	258	258	258	258	258	259
Radiation monitoring								
Stations measuring daily gamma radiation exposure	42	42	42	42	34	34	34	34
Stations taking precipitation samples to calculate aggregate beta-activity	25	25	25	25	25	25	25	25
Analytical laboratories								
Uzhydromet	21	21	21	21	21	21	21	21
Certified laboratories	17	17	17	17	17	18	19	19
Environmental Inspection	17	17	17	17	17	17	17	17
Certified laboratories	1	1	2	2	2	2	5	5
Sanitary and Epidemiological Supervision Department	138	..	..	..	..	..	..	175
Certified laboratories	23	..	..	..	..	..	..	43
State Committee on Geology and Mineral Resources	4	4	4	4	4	4	4	4
Certified laboratories	4	4	4	4	4	4	4	4

Sources: Communications to the EPR team by Uzhydromet, the State Committee for Nature Protection, the Ministry of Health and the State Committee on Geology and Mineral Resources, 2009.

Monitoring protocols follow the requirements of the monitoring instructions issued in the former Union of Soviet Socialist Republics (USSR) in the 1980s and have never been reviewed and revised. Sampling is carried out manually following a shorter version of the programme at most stations: samples are taken three times a day, contrary to the four times required by current monitoring regulations. Owing to the low frequency of measurements and the absence of automated monitors, accidental or intentional short-time emissions into the air by polluters are not registered.

The monitoring equipment currently used by Uzhydromet ranges from 15 to 30 years' old. The

requirements for air sampling devices are covered only up to 40 per cent. Owing to the insufficient supply of testing chemicals, reference specimens and other reagents, the measurement of carbon bisulfide and hydrogen chloride discontinued in the early 1990s and has not resumed. For the same reason, a number of parameters are measured only sporadically in most cities or the measurements are not reliable, especially ground-level ozone data. Samples are tested by photometric methods only. Modern physical and chemical testing methods like the atomic absorption spectroscopy, gas–liquid chromatography or polarography are not used in Uzbekistan.

Table 3.2: Integrated air pollution index in the most polluted cities, 2001–2007

City	2000	2001	2002	2003	2004	2005	2006	2007
Navoi	7.62	7.09	6.46	5.51	5.76	5.80	5.36	5.61
Nukus	5.06	5.04	..	5.18	5.62	5.07	5.08	5.25
Angren	3.63	4.20	4.60	5.13	5.38	5.57	5.17	5.22
Fergana	5.94	5.84	5.06	4.98	4.70	4.87	4.64	5.09

Source: Uzhydromet. The Review of Air Pollution and Emissions of Hazardous Substances in Cities in the Area of Activity of Uzhydromet in 2007. Tashkent, 2008.

The hazards to human health and the environment posed by the high air pollution levels regularly registered by Uzhydromet in the cities of Angren, Fergana, Navoi and Nukus may be underestimated because of the above-mentioned gaps and weaknesses. The integrated air pollution index calculated annually by Uzhydromet on the basis of its monitoring data has continually demonstrated the highest values in these four cities among those covered by the monitoring programme over the period 2001–2007 (table 3.2). The integrated air pollution index records when the maximum allowable concentrations (MACs) of five pollutants representative of the urban area in question have been surpassed. These are usually TSP, SO₂, NO_x, CO and formaldehyde. The annual mean concentrations of each of the five pollutants are used when calculating the index.

Three monitoring stations located in Sarriassiya in the Surkhandarya region, near the border with Tajikistan, are considered transboundary stations in Uzbekistan. They are intended to measure hydrogen fluoride in the ambient air which originates from the Tajik Aluminium Plant. These three stations do not, however, meet the basic (level 1) requirements for transboundary stations established by the Cooperative Programme for Monitoring and Evaluation of the Long-range Transmission of Air Pollutants in Europe (EMEP). The non-application of internationally agreed methodologies for the assessment of transboundary fluxes of air pollutants do not support Uzbekistan's efforts to assess the transboundary impact of the Tajik Aluminium Plant's emissions.

The Ministry of Health, through the Sanitary and Epidemiological Supervision Department, monitors air quality in the sanitary protection zones of enterprises, workplaces and residential areas.

Surface water monitoring

Uzhydromet generally maintained the overall number of observation points on the rivers, canals and reservoirs from 2001 to 2008 (table 3.1). It currently

monitors surface water quality at 109 gauges on 61 water bodies. The number of observation points is below the requirements of the applicable water monitoring regulations. The observation points are located only on large water bodies. Diffuse pollution of surface waters is insufficiently monitored in Uzbekistan.

The current network provides data on some 50 parameters and assesses chemical composition and the presence of suspended and organic matters, main pollutants and heavy metals. The number of watercourses where hydrobiological observations are conducted has decreased by one third since 2001. These observations are limited to the Tashkent region. The hydrobiological parameters measured cover periphyton, zoobenthos and macrovegetation.

Samples are taken manually either monthly or yearly or according to hydrological phases, depending on the size of the water body. The data collected and analysed by Uzhydromet demonstrate stable pollution levels at the monitoring points which are frequently close to the requirements of water quality standards (MACs). The most polluted watercourses in Uzbekistan include the Salar Canal (downstream of the cities of Tashkent and Yangiul), the Siab water collection system in Samarkand City and the Zarafshan River downstream of the Siab water collection system estuary.

Overall, water quality monitoring in Uzbekistan suffers from similar deficiencies to air quality monitoring, which are mainly due to aging monitoring equipment and the insufficient funding of recent years.

Other institutions are involved in inland surface water monitoring. For instance, the Ministry of Agriculture and Water Management monitors the discharge and water quality of drainage waters. The Ministry of Health monitors the microbiological and chemical parameters in drinking water and bathing water. Since 2002 it has been monitoring water quality at fixed

gauges on the Zarafshan River and its tributaries in the Bukhara, Navoi, Samarkand and Jizzakh regions.

Since the end of 2007, the Aral Sea Operating Company, the joint venture of oil companies, monitors the environment at 25 observation stations in the eastern and western parts of the Uzbekistan part of the Aral Sea, at the Vozrozhdeniya Peninsula and at sites of seismic operations. The monitoring activities were agreed upon with the SCNP.

Although Uzbekistan does not cooperate with its neighbours in monitoring the quality of transboundary waters, cooperation is taking place on their use and protection (more details in chapter 4).

Groundwater monitoring

Since 2001, the number of groundwater observation sites, operated by the State Committee on Geology and Mineral Resources, has decreased by some 40 per cent (table 3.1). This is explained by the optimization of the observation network towards the needs of a groundwater supply for drinking water rather than for agricultural purposes. As a result, only 1,671 groundwater wells from the total of 28,800 operational groundwater wells were being monitored in 2009. The current network covers wells supplying groundwater for drinking water in 120 cities and towns. This contraction of the network has been accompanied by an annual increase in financing over the period 2000–2009 by 15–20 per cent. This made it possible to reequip the observation network and deepen the wells.

Groundwater observation sites are primarily intended to assess groundwater levels (water availability) and natural geochemistry. Samples are taken twice a year. All samples undergo a so-called reduced chemical analysis, which covers 13 to 14 parameters, including nitrates, the pH and heavy metals. Samples taken from aquifers supplying groundwater for drinking water are analysed against the full drinking water quality standard (GOST Standards).

Groundwater monitoring data are used to assess the sources of adverse impacts on aquifers. The results of the monitoring programme show a decrease in the groundwater pollution by nitrates from agriculture throughout the country, and an increase in the pollution from industry in the City of Zarafshan and its surroundings. Studies are under way on groundwater pollution by a petroleum storage depot

in the City of Angren and a refinery plant in Fergana City. Forty-five observation points on the Aral Sea bed help to assess the impact of the lowering sea level on groundwater in the area.

The observation network also attempts to assess the transboundary impact on groundwater quality in Uzbekistan. Twelve observation points focus on the assessment of the impact of the Tajik Aluminium Plant. Several observation points near the Mailuu-Suu and Sumsar Rivers assess the pollution of groundwater from tailings located in Kyrgyzstan.

Soil and land monitoring

Uzhydromet monitors soil pollution on agricultural land for 10 chemical substances. It also measures soil acidity (pH) and humus. Samples are taken from agricultural observation points twice a year. In 2007, for instance, the concentration of pesticides in soil was assessed in the 12 regions and in the Republic of Karakalpakstan. Soil polluted by industry around cities is analysed for 20 hazardous substances. Samples are taken every five years at these points. In 2007, for instance, soil samples were analysed near the cities of Nukus, Samarkand and Chirchik.

The Ministry of Health takes sporadic soil samples in residential and recreational areas in cities, at industrial sites, at sites allocated for construction and in villages. Concentrations of nitrates, heavy metals and microbial contamination are analysed. Since 2005, the Ministry of Health has been monitoring soluble fluoride in soil in the Surkhandarya region, which is exposed to pollution from the Tajik Aluminium Plant.

The State Committee on Land Resources, Geodesy, Cartography and State Cadastre (SCLR) monitors land following the 2000 Cabinet of Ministers Resolution on Land Monitoring. The Research Institute of Soil Sciences and Agrochemistry developed methodological guidance for monitoring land in Uzbekistan in 2000. It is implementing an extensive state programme aimed at describing all soil parameters at selected (“dominant”) plots throughout the country. By early 2009, studies had been completed in eight regions. The programme to be completed by 2013 is expected to lay down the basis for setting payments to farmers for their land. In 2008, the SCLR published soil maps of Uzbekistan with the scale of 1:750,000. It publishes an annual national report on the state of land resources in Uzbekistan describing, among others, the quantitative

and qualitative conditions of soils. However, the report does not cover soil erosion. The SCLR plans to publish atlases of land resources by region in 2009.

Monitoring of biodiversity, including forests

The last state inventory of forests in Uzbekistan was carried out in 1988. An inventory has not been conducted since, despite the fact that, according to the country's legislation, one should take place every five years. Forest fires are not monitored in Uzbekistan. The forest management enterprises (about 100) reporting to the Forestry Management Department, of the Ministry of Agriculture and Water Management, conduct annual seasonal evaluations of their forests. The results are reported in a statistical form to both the State Committee on Statistics and the Forestry Management Department. Inventories of other plants have never been prepared in Uzbekistan. The Ministry of Agriculture and Water Management collects, but does not publish, data on 35 species of medicinal plants cultivated by specialized forest management enterprises.

In 2000, the Forestry Management Department developed methodological guidance for the preparation of a comprehensive forest inventory (cadastre). In 2005, the Cabinet of Ministers adopted the Regulations on the Procedure to Prepare State Cadastres. The aim of the forest cadastre, which should include data on forest area, composition, age, state and wood stocks and on the production of wood and non-wood products by forest management enterprises, districts, regions and the country at large, is to produce a monetary evaluation of the country's forests. As the Forestry Management Department was not provided with additional staff for this purpose, the data collected to date meet from 35 to 65 per cent of the requirements by specific data categories. The data are neither published nor used.

With the involvement of experts from the Academy of Sciences and Tashkent State University, five state game husbandry farms under the Ministry of Agriculture and Water Management prepare annual inventories which cover the populations of 14 mammals and 7 bird species for which the SCNP establishes hunting quotas. Data are submitted to the State Committee on Statistics according to a statistical form. Inventory results on individual species are published sporadically in the SCNP Environmental Bulletin. Although state game husbandry farms are also obliged by law to report on populations of

threatened species present on their lands, they fail to do so.

Protected natural areas, namely six mountain nature reserves and three desert-tugai nature reserves, two mountain national parks, nine nature refuges and the Bukhara Specialized Jeyran Gazelle Nursery (Jeyran Ecological Centre), are managed by their respective administration. Their administrations collect data on animal species occurring in their territories and submit them in the annual reports presented to the supervisory authorities, either the Ministry of Agriculture and Water Management or the SCNP. These reports are not used for policymaking on the protection of biodiversity in Uzbekistan; neither are they accessible to the public.

In 2006, the SCNP and the Institutes for Biology and Zoology of the Academy of Sciences jointly published the second edition of the country's Red Book, covering threatened species including 23 mammals, 48 birds, 16 reptiles, 17 fish, 3 annelids, 14 molluscs and 61 arthropods.

In accordance with the 2000 Regulations on the State Cadastre of the Flora of the Republic of Uzbekistan and the Regulations on the State Cadastre of the Fauna of the Republic of Uzbekistan (Cabinet of Ministers Resolution), the SCNP was designated as the public authority responsible for preparing and updating the two cadastres in question. The goal was to put in place a system for continuously collecting data on taxonomic status, population, areas of occurrence, and the state of habitats and monetary assessment of wildlife species in the country. The following bodies were responsible for ensuring data inputs as follows:

- The Ministry of Agriculture and Water Management for wild medicinal plants and ornamental plants used for food, game and commercial animal species, and for animal pests in agriculture and forestry;
- The SCNP for ornamental plants used as technical crops;
- The State Committee on Land Resources, Geodesy, Cartography and State Cadastre for plants from pastures and hayfields;
- Nature reserves and national parks for all animal species occurring in their territories;
- The Ministry of Health for animals that carry dangerous infections;
- The Academy of Sciences for rare and endangered animal and plant species and other animals not mentioned above.

Commercial fish species were reported on by the Uzryba State Corporation, which was abolished. The SCNP had to establish formats for data submission to the two cadastres and to make an information database fully operational. On 1 April 2005, the Cabinet of Ministers adopted the Regulations on the Procedure to Prepare a State Cadastre of Protected Natural Areas, making the SCNP also responsible for this cadastre.

As the SCNP and the other ministries and agencies concerned were not provided with budgets for the purpose, during the first five years practically no activity was undertaken towards the preparation of the above cadastres. In 2006, the SCNP created the Division on Monitoring and Cadastres at its State Inspectorate for the Protection and Rational Use of Flora and Fauna and Nature Reserves. Its activities resulted in maps of the plant communities of the Jizzakh and Navoi regions, a wildlife inventory of two areas in the Republic of Karakalpakstan, reports on animal life in the Kashkadarya and Surkhandarya regions, among others. It is currently preparing a report on the herpetetic fauna of Uzbekistan in the form of a cadastre. The Division on Monitoring and Cadastres cannot operate as a legal entity and this consequently hampers field studies by Division staff and prevents it from subcontracting studies to research institutions.

No progress has been made towards the preparation of the state cadastre of protected natural areas.

Pollution monitoring

The SCNP, through its State Specialized Inspectorate for Analytical Control (SSIAC), monitors emissions and discharges produced by industrial and transport enterprises, and checks the conformity of monitoring data with the emission and discharge levels established in permits. From a total of some 2,000 large and medium-size enterprises in the country, in the late 1990s the SSIAC established a list of some 350 enterprises (mostly in the energy, chemical industry and mining sectors) that are subject to regular SSIAC monitoring. At 141 of these enterprises, air pollution emissions are monitored monthly; at 116 enterprises (75 of which are wastewater treatment plants), discharges into water bodies (for wastewater treatment plants) or into the urban wastewater collection system (for other enterprises) are monitored quarterly; and soil pollution at 92 sites (toxic chemical landfills, former agricultural airfields, tailing dumps, industrial zones and sites near

refineries and petroleum storage depots) is monitored twice a year. Many of these enterprises do not have their own analytical laboratories.

The SSIAC monitoring data demonstrate continuous exceedances of air pollution emission limits by specific enterprises: by 6 times for CO, by 5 to 8 times for NO_x, by 4 to 24 times for SO₂, and by 10 to 24 times for TSP. Many wastewater treatment plants are inefficient as the treated water they discharge into water bodies significantly exceeds MACs for ammonium, nitrites, organic substances, copper, chrome and oil products. Although the soil pollution at old pesticide landfills and former agricultural airfields has been decreasing, it still substantially exceeds the MACs in terms of chlororganic pesticides. The areas of agricultural lands polluted by nitrates and phosphates have been increasing in Uzbekistan.

Exceedances in MACs for copper content in soil by 8 to 9 times have been continuously registered at some industrial enterprises. Soil pollution by oil products is a concern near refineries and petroleum storage depots in several regions. Pollution monitoring is not linked to the environmental inspection visits made at these enterprises. These visits are limited to one every two years for each enterprise and should be approved by the National Council for the Coordination of Enforcement and Control, which coordinates all types of inspections at enterprises (chapter 2). Additional environmental inspections of up to 3 hours may be conducted at enterprises when complaints have been made by citizens or following an accident. In this context, pollution monitoring by the SSIAC serves as an important data source on the actual pollution levels generated by enterprises between inspections. The results are used by the regional environmental inspections for adjusting pollution payments and charges paid by individual enterprises. These adjustments are approved quarterly. On a monthly basis, the regional SSIACs report monitoring data on emissions to the central SSIAC; on a quarterly basis, they submit explanatory information; and they annually report data on exceedances in the established limits concerning emissions, discharges and soil pollution.

Analytical laboratories

The SSIAC has 1 central and 28 territorial analytical laboratories. Five of these laboratories specialize in the assessment of pesticides in water and soil. The central and four territorial laboratories have been

accredited according to the relevant international standard (the recommended standard in the joint International Organization for Standardization (ISO)/International Electrotechnical Commission (IEC) publication 17025:2005, General requirements for the competence of testing and calibration laboratories) and two more are expected to be accredited in 2009. The SSIAC develops methods for measuring polluting substances in emissions and discharges. It conducts annual intercalibration exercises with the analytical laboratories of Uzhydromet, the Ministry of Health and State Committee on Geology and Mineral Resources. It verifies the measurement quality of enterprises' analytical laboratories and certifies these laboratories. At the same time, the SSIAC provides monitoring services to private enterprises in return for payments. In some cases, this may create conflicts of interests.

Uzhydromet operates 17 laboratories analysing air quality, 2 laboratories analysing water quality and 1 laboratory that analyses soil quality. None of these laboratories has received accreditation according to ISO 17025:2007. However, the measurement devices are certified.

The number of sanitary and hygiene laboratories operated by the Ministry of Health increased from 138 in 2001 to 175 in 2009, and the number of laboratories accredited according to ISO 17025:2007 increased from 23 to 45. Many of these laboratories have been refurbished and reequipped. This has made it possible to increase the number of analysed parameters in air samples from 28 to 32, in water samples from 21 to 26, and in soil samples from 12 to 24 since 2001. The central laboratory in Tashkent introduced new analytical methods for the detection of heavy metals in water and food products. The project that the Islamic Development Bank agreed to finance in Uzbekistan from 2010 onwards is expected to provide all sanitary and hygiene laboratories with additional modern equipment for improved monitoring of pollution and foodstuffs. Two hundred and ten bacteriological laboratories of the Ministry of Health (43 of which are accredited according to ISO 17025:2007) analyse the quality of drinking water and bathing water as well as soil quality and foodstuffs. All 23 radiological laboratories of the Ministry of Health have received accreditation to measure exposure to ionizing radiation at 1,740 installations and/or facilities. Both bacteriological and radiological laboratories were refurbished to various extents in 2001.

The State Committee on Geology and Mineral Resources has one central laboratory and three territorial ones. None of them has received ISO 17025:2007 accreditation. However, the measurement devices are certified.

The overall developments in the analytical laboratories in Uzbekistan are presented in table 3.1.

Ambient quality standards

Although Uzbekistan continues to apply most former USSR ambient environmental standards (MACs), it has either formally reapproved them as national standards, or slightly revised or reissued them. The system of standards remains comprehensive and overambitious. It covers the following:

- 478 MACs for ambient air approved by the Ministry of Health in 2005, 2006 and 2008 as well as 3 MACs that have been recently approved by the SCNP for the exposure of vegetation to air pollution;
- 952 MACs for water quality in water bodies of importance for fishing (covering 912 chemical substances and 40 poisonous weed- or pest-killers) approved by the Ministry of Fisheries of the former USSR in 1990, and 46 MACs for drinking water quality (38 chemical, 6 bacteriological and 2 radiological parameters) approved the Ministry of Health in 2000;
- 111 MACs for soil quality approved by the Ministry of Health in 2005.

There is no inter-agency coordination for consultation in Uzbekistan when reviewing, developing or revising MACs. As a result, there is a disparity between the nominal MACs and their actual implementation (compliance).

An excessively large number of regulated pollutants imposes unrealistic monitoring and enforcement requirements on the public authorities. Since a number of Uzbek standards are below the detection and calculation thresholds, it is impossible to know whether or not they are being implemented. Furthermore, due to budget limitations, there is no routine monitoring of many pollution parameters that should be measured according to monitoring standards. For instance, the SSIAC measures only 4 to 40 air parameters, 5 to 20 water parameters and 26 soils parameters.

On the other hand, some substances are unregulated (for example, phosphorus, which may lead to eutrophication, and carcinogenic substances in water). Water quality parameters are not defined for recreational purposes or for the maintenance of aquatic ecosystems.

Existing ambient quality standards must be amended and developed to provide a system that can work for all stakeholders. A revised system of ambient quality standards has to focus on hazardous substances, taking into account both international guidelines and specifics of the environment.

3.3 Information management and reporting

Information systems and pollution reporting

The SSIAC operates a database covering data from its pollution monitoring. The database is well structured and may provide data by polluting parameters and by individual enterprises. Once every two years, the SSIAC publishes the Information Bulletin on the State of Pollution Sources and their Environmental Impact in the Republic of Uzbekistan. The innovative feature of the Bulletin is that it publishes exceedances in pollution levels by individual enterprises and compares them to the established limit values (for air pollution) and relevant MACs (for water and soil quality). This system of “naming and blaming” is rather unique among the countries that the United Nations Economic Commission for Europe (UNECE) has reviewed over its second cycle of reviews. The last Bulletin was published in 2007 with a circulation of 400 copies. However, the Bulletin and the pollution monitoring data are not uploaded on the Internet.

Uzhydromet has been operating its electronic database on the quality of air, surface water and soil since 1996. It publishes the following:

- Daily environmental bulletins;
- Monthly information notes on air pollution in the cities of Almalyk, Angren, Bekabad, Chirchik and Tashkent, and on high and extremely high levels of environmental pollution in the country;
- Monthly bulletins on water quality in main watercourses by hydrochemical indicators;
- Nine bulletins a year on the ecological conditions of the main watercourses of the Tashkent region and the water quality of these watercourses by hydrobiological indicators;
- The yearbooks of surface water quality and of soil pollution;

- The annual review of air quality and polluting emissions in cities and towns.

These publications are circulated among some 50 public institutions in the country. They are not easily accessible by the public. The monitoring information that Uzhydromet uploads on its website (www.meteo.uz) is limited to the daily status and short-term forecasts of air pollution in Tashkent.

The State Committee on Geology and Mineral Resources operates a groundwater database on the levels and quality of groundwater. It publishes an annual information bulletin on the state of groundwater and its use. The Ministry of Health publishes a monthly information bulletin on hygiene, ecology and human health. These bulletins are circulated among the public authorities in a limited number of copies. They are not easily available to the public; neither are they available online.

Uzbekistan does not have an integrated or interconnected environmental electronic database.

Environmental statistics

The State Committee on Statistics continues to collect environment-related statistical data following the statistical forms that were introduced 20 to 30 years ago, practically without having made any changes. These cover the following: air emissions and their treatment; forest areas, reforestation, and the harvesting of non-wood products; fish hauls and reproduction at fish farms; land reclamation; protected natural areas; current costs of environmental protection; and payments for environmental pollution. Important environmental issues, such as transport emissions, greenhouse gas emissions, the consumption of ozone-depleting substances, wastewater discharges and generation, and the treatment and final disposal of industrial non-hazardous waste, are not covered by statistical data collection. The only development since the first EPR took place was the 2006 streamlining of statistical reporting by small enterprises (up to 100 employees) on their air emissions, wastewater discharges and waste generation.

Unlike Kazakhstan, Kyrgyzstan and Tajikistan, Uzbekistan does not publish a regular statistics compendium on the environment. A limited number of environment-related data are published in the national Statistical Yearbook, which is distributed



Consultation with NGOs during the EPR mission, Tashkent, 2009

as a sales publication only. The State Committee on Statistics produces an annual bulletin on the main indicators of environmental protection and the rational use of natural resources for restricted use by selected public authorities only. Thanks to the financial support of the United Nations Development Programme (UNDP), in 2006 the State Committee on Statistics published an ad hoc statistical bulletin, *Environmental Situation and Utilization of Natural Resources in Uzbekistan: Facts and Figures 2000–2004*. Many environmental data collected by the State Committee on Statistics are not available to the Uzbek public. Data are provided upon request and in return for payment only. The State Committee on Statistics does not upload environmental statistical data onto its website.

State-of-the-environment reporting

The SCNP publishes 1,000 copies of a national report on the state of the environment and the use of natural resources in Uzbek, Russian and English. The last such report was published in 2005 and covered the period 2002–2004. Parts of the report are available on the SCNP website. The report is largely descriptive and does not follow the UNECE Guidelines for the Preparation of Indicator-based Environment Assessment Reports in Eastern Europe, Caucasus and Central Asia endorsed at the sixth Environment for Europe Ministerial Conference (Belgrade, 2007). It remains a compilation of information submitted

by various ministries and agencies. The use of report findings for environmental policymaking is limited.

In 2008, the SCNP published the National Report on the State of the Environment and Rational Use of Natural Resources (1988–2007). It includes environmental data for 2007 and is very informative; nonetheless, it is not an indicator-based or easy-to-read report. One thousand copies of the report were circulated throughout the country. In 2008, the SCNP published the Environmental Profile of Uzbekistan for 2008 Based on Indicators and the Environmental Atlas of Uzbekistan. Both publications resulted from the UNDP project and promoted the application of the environmental indicators developed by the UNECE in cooperation with the European Environment Agency. The sustainability of the application of internationally agreed environmental indicators in Uzbekistan is questionable as there is no evidence that the SCNP has taken any action to ensure the replication of indicator-based assessments in the future.

Once every two years, the SSIAC publishes the report, *Environmental Monitoring: Report on the State of the Environment and Use of Natural Resources*. It presents the results of air, water and soil monitoring in the country as obtained by six governmental institutions responsible for specific monitoring networks. It identifies pollution trends and the main threats. The most recent report was published in 2007 and 1,000 copies were circulated.

Table 3.3: Telecommunications development per 100 inhabitants, 2001–2006

	2001	2002	2003	2004	2005	2006
Internet users	0.60	1.09	1.92	2.55	3.31	4.08
Personal computers	..	..	1.59	2.18	2.82	3.08
Telephone lines	6.66	6.65	6.70	6.61	6.74	..

Source: United Nations Statistics Division, 2009.

3.4 Public participation

Non-governmental organizations

Uzbek legislation requires that non-governmental organizations (NGOs) register with the Ministry of Justice or its territorial bodies. While the registration procedure is relatively simple, the operational regulations are rather complicated. For instance, NGOs are obliged to report regularly on their activities to the State Committee on Statistics and the Taxation Agency. When an NGO plans to organize a meeting, it has to inform the Ministry of Justice on the meeting type and sources of financing. The Ministry has to approve the expenditure of the funds; the approval procedure may take from one to six months. If an NGO does not have a cash flow on account for six months, the Ministry of Justice may liquidate it.

According to the Ministry of Justice database, there were 7,162 NGOs in Uzbekistan in 2009. Some 200 of these NGOs declared environmental protection to be their main area of activity. In reality, only some 45 environmental NGOs are considered to be active. There are only three active environmental NGOs in Tashkent City and the Tashkent region, possibly because of strict state regulation.

In 2004, the Government approved the Resolution on Streamlining the Use of Grants, which channelled the use of grants through two national banks only. A commission was established to oversee and authorise the use of grants. In the same year, Uzbekistan toughened the Criminal Code and the Administrative Responsibility Code to make the use of grants difficult. Whatever motivated these measures, they rather complicated NGO operations. To remedy the situation, Uzbekistan adopted the 2007 Law on Guarantees for Non-governmental Organization Activities. The Law envisages providing NGOs with state grants and subsidies under certain conditions. There is no evidence that the Law has become operational.

NGOs such as Education for Life, For the Environmentally Clean Fergana, Ecomaktab and Logos play a significant role in extra-curricular environmental education. In 2004, some 40 environmental NGOs established the European Eco Forum, a coalition of NGOs.

The SCNP financially supports environmental NGOs using its National Fund for Nature Protection. The grants are provided through a tender procedure. From 2004 to 2009, the annual number of grants provided to NGOs increased by more than 300 times from 250,000 to 77,000,000 sum. It appears, however, that grants are provided to a small number of country NGOs, namely the International Fund for Ecology and Health (Ecosan), Logos, Living Nature and Ekomaktab. So far, such grants have been provided for environmental education purposes. In 2009, for instance, the SCNP provided a grant to Ecomaktab to develop a concept to promote education for sustainable development in Uzbekistan and to prepare a state-of-the-art review on the subject.

To promote cooperation with NGOs, the SCNP plans to sign a memorandum of understanding with the European Eco Forum. It has prepared recommendations for its territorial departments on the procedures and areas of cooperation with NGOs. The SCNP is considering establishing in the near future a (consultative) public council, which would be chaired by the Head of the SCNP and consist of SCNP senior officials, academics and NGO representatives. With such a prospective composition, the potential effectiveness of the council as a mechanism of cooperation with civil society is doubtful.

Access to information

The SCNP has been actively disseminating environmental information to raise public awareness in Uzbekistan. In 2002, it created its website, which was converted into a web portal the following year. The SCNP established the Chinar publishing house that publishes the monthly Environmental Herald in Uzbek and Russian with a total circulation of

Table 3.4: Training environmental specialists at universities; number of graduates by selected curricula, 2001–2008

	2001	2002	2003	2004	2005	2006	2007	2008*
Chemistry and ecology	..	39	..	..	280	270	317	365
Environment protection (engineering)	91	86	1	..	..	141	141	..
Environment protection (in industry)	..	..	..	..	134	..	141	141
Ecology and natural resources management	..	33	187	247	267	246	10	239

Source: The State Committee for Statistics, 2009.

Note: *Estimated.

4,000, with supplements for children. Chinara also publishes many ad hoc environmental publications such as Protected Nature Areas of Uzbekistan, Nature Reserves and National Parks, the three-volume Popular Environmental Encyclopedia and various brochures, booklets and posters. Financing is provided from both the state budget and the National Fund for Nature Protection. The SCNP Scientific and Technical Board approves the publication plan. The SCNP finances monthly environmental programmes on national television and radio stations and organizes training, contests and press conferences.

Pursuant to the 2006 Cabinet of Ministers Resolution on Measures to Develop the Interaction of State and Economic Management Bodies with the General Public, the SCNP established an information service, which manages, among other things, the SCNP web portal (www.uznature.uz) and coordinated the development of the websites of SCNP territorial bodies. The web portal is updated weekly and had some 1,200 visits a month in spring 2009.

In this respect, it should be noted that the possibilities for the general public to access environmental information through communication means are very limited in Uzbekistan, especially in rural areas (table 3.3).

NGOs claim that the mass media avoid discussing acute environmental problems in Uzbekistan and point out that barriers to public access to information include: (a) the poor dissemination of environmental information by Uzhydromet, the State Committee on Statistics, the Ministry of Health, the Ministry of Agriculture and Water Management, and the State Committee on Geology and Mineral Resources; and (b) the lack of periodic environmental publications aimed at the general public, rather than at technical experts and academics. As a result, according to NGOs, the public in Uzbekistan is not sufficiently

informed about environmental issues of concern such as the pollution of urban air, drinking water, groundwater, soil and foodstuff, especially by pesticides.

Environmental decision-making

Legislation does not provide for public participation in developing legal acts, regulations or programmes. Since 2006, draft laws are not published in the National Newsletter. Nonetheless, the SCNP involves members of the public in the discussion of such documents by inviting representatives of specialized NGOs to the meetings of its Collegium (management board). Although the SCNP had invited NGOs to comment on the draft law on waste management, it provided no subsequent feedback on whether or not the comments had been taken into account. The Ministry of Agriculture and Water Management organized public hearings for a draft concept on forestry protection in Uzbekistan for 2008–2009.

According to the 2000 Law on State Ecological Expertise (SEE) and the 2001 Cabinet of Ministers Resolution on the Regulations on State Ecological Expertise, the public may access documentation on the environmental impact assessment of a proposed activity, plan or programme only if it undertakes the so-called public ecological expertise (PEE). PEE results are of recommendatory status for the SEE, which authorizes a project, plan or programme that may have an adverse environmental impact. Few PPEs have actually been undertaken in Uzbekistan. The SEE frequently seeks the opinion of citizens who live close to the proposed economic activity when the activity may lead to the demolition of houses, the siting of catering enterprises or the withdrawal of agricultural plots. The SEE forces the developer to organize public hearings for this purpose and to submit the outcome with citizen signatures to the SEE. Citizens have the right to appeal against

authorizations given by the SEE. There are no known cases of such appeals being made in practice.

Legislation does not provide for public participation in the issuing of environmental permits in Uzbekistan. The SCNP and its regional bodies, upon request, grant access to information on the results of environmental inspections to members of the public. The SCNP regional administrations involve representatives of the public as voluntary inspectors in their inspection work and provide for their training.

3.5 Environmental education and education for sustainable development

Preschool and school education

Many preschool educational institutions in Uzbekistan organize learning activities to familiarize children with nature and environment. Some 40 percent of all preschool institutions have specific premises for environment education and 16 percent of institutions laid out “Environmental Trails” where children learn to care about nature.

All primary schools in Uzbekistan cover environmental issues in the subject “Surrounding World” at levels 1 and 2, and in the subject “Man and Nature” at levels 3 and 4. There are no environment courses as such in the secondary and high schools. Some environmental subjects are integrated in courses on natural sciences and on health and healthy lifestyle. Manuals were developed on Biodiversity, Man and Earth, Man and Air, and on Water as Source of Life for use by pupils of levels 5 to 9 as supplementary learning materials. In 2005, a methodological guidance on Environmental Education in Primary School was developed. In 2009, a manual on Man and Nature was published for teachers of levels 5 to 9. The SCNP published several manuals on environmental topics for preschool educational institutions and schools.

The National Education Centre at the Ministry of Public Education conducts teacher training on education for sustainable development (ESD). Some teaching manuals on ESD were published with the support of the United Nations Educational, Scientific and Cultural Organization (UNESCO) and the Central Asian Regional Environmental Centre. The Ulugbek National University in Tashkent published a methodological and training guidance on ESD for schoolchildren and teachers.

Professional and higher education

In all vocational training schools (‘professional colleges’) in Uzbekistan provide binding courses on Ecology or on Environment Protection. There are curricula on Ecology and Environment Protection, and on Monitoring of natural Disasters. 80 percent of graduates get jobs.

Uzbekistan adopted State standards for several environmental curricula. An Ecology course is a mandatory one for all institutions of higher education of the country. Practically all technical universities train environmental engineers. The Ulugbek National University as well as the Andijan, Bukhara, Karakalpakstan, Samarkand and Termez Universities train bachelors on Ecology and Nature Use curriculum. The Tashkent Economic University trains bachelors on Environmental Economist curriculum. There appear to be no curricula on important subjects such as environmental management, environmental law and environmental monitoring. Table 3.4 presents the number of students who graduated with specialization in specific environment-related subjects from universities in Uzbekistan from 2001 to 2008.

At Urgench University, there is a chair on sustainable development and environmental education. The Biological Department of the National University of Uzbekistan (NUU) teaches a course on sustainable development.

Retraining

In 2006, the SCNP and the NUU established a joint centre to train environmental experts and develop environment training programmes and manuals. In 2008, the Moscow State Academy of Fine Chemical Technology (named after M.V. Lomonosov) became a co-founder of the centre. The NUU members and SCNP senior staff conduct training courses for SCNP personnel and environmental experts of industrial enterprises. In 2008, the centre trained 96 experts in the country. The SCNP organizes ad hoc environmental training sessions for enterprises. Overall, the environmental training of civil servants in Uzbekistan is not consistent or systematic.

Informal education

Informal education among the country population is carried out by the SCNP, the administrations of protected natural areas, specialized environmental

institutions, the “Bioecosan” National Training and Methodological Centre and NGOs. For instance, the Bukhara Specialized Jayran Gazelle Nursery organizes educational events for schoolchildren, students and local communities. The Zarafshan Reserve, the Tashkent Botanical Garden and the Ugam-Chatkal National Park are among other institutions that are active in informal environmental education in the country. Education for Life is an NGO that runs an environmental education centre for schoolchildren.

3.6 Policymaking framework

Monitoring and information

Uzbekistan has made significant progress towards the creation of an integrated environmental monitoring system. The 2002 Regulations on State Environmental Monitoring set out the scope, purposes and outputs of state environmental monitoring in the country and specify the tasks and responsibilities of six governmental bodies: the SCNP, Uzhydromet, the Ministry of Health, the Ministry of Agriculture and Water Management, the State Committee on Geology and Mineral Resources and the SCLR. Monitoring activities should be conducted based on a government-approved monitoring programme. The SCNP was made responsible for the coordination of state environmental monitoring, the approval of a unified monitoring methodology to be followed by the relevant government bodies, and for the collection and evaluation of monitoring data and their delivery to decision makers and the public, including in the form of the annual national state-of-the-environment report.

Although the state environmental monitoring system was expected to cover wildlife monitoring, the Regulations do not establish responsibilities to this effect. As a result, biodiversity and ecosystem monitoring remains underdeveloped in Uzbekistan.

To better coordinate the implementation of the state environmental monitoring programme, the SCNP established an inter-agency coordination council in 2002. Since 2006, the council has not been meeting; nonetheless, the coordination continues at the working level.

To follow up the Regulations, the Government approved two subsequent monitoring programmes. The first programme (for 2003–2005) was approved in 2003, the second one (for 2006–2010) in 2006.

It would appear that these subsequent programmes represented a compilation of routine monitoring activities by the six governmental bodies responsible for the state monitoring programme. Activities were frequently described in a very general form and clear priorities were not set. Nonetheless, the programmes demonstrate the increase in state budget allocations for environmental monitoring in Uzbekistan. From 2003 to 2006, the annual allocations for such monitoring increased from 1,884.6 million to 2,818.8 million sum (or in current US dollars from \$1.94 million to \$2.31 million).

Specific measures for the development of the state environmental monitoring programme were included in the state action programmes for environmental protection for 1999–2005 and 2008–2012 adopted by the Government in 1999 and 2008, respectively. The latest programme envisages, for instance: (a) the procurement of equipment for monitoring emission sources, the pollution of agricultural lands and groundwater; (b) the preparation of specific biodiversity studies; and (c) the development of a centralized environmental database at the SCNP Information Centre. It is too early to assess whether any progress has been made in these areas.

In parallel, the Government approved some programmes to strengthen monitoring in areas where pollution levels were of particular concern. These related to integrated observations of water quality in specific stretches of the of Amu Darya River, the Kashka Darya River and the Zarafshan River, in areas of the Surkhandarya region that are exposed to the transboundary impact of the Tajik Aluminium Plant and in the cities of Almalyk and Bekabad.

The SCNP issued several guidance documents to facilitate the comparability of monitoring results and information exchange. Nevertheless, a number of gaps and weaknesses remain, especially gaps in monitoring coverage, the obsolete nature of monitoring equipment and devices, the low reliability of monitoring data, the non-comparability of monitoring methods and procedures with internationally agreed standards, the lack of a centralized or interconnected environmental database, and, last but not least, the insufficient use of monitoring results in policymaking and decision-making.

According to the 2000 Law on State Cadastres, the Government must establish and continually update 21 state cadastres, including those on land, surface water, groundwater, forests, flora, fauna, protected natural

areas and waste. Data should include quantitative and qualitative assessments as well as monetary estimates of each resource. Not only is the task overambitious, but its implementation is not supported by staff, financing or methodological guidance. As a result, the progress made in the compilation of individual cadastres is rather poor.

The Regional Environmental Action Plan for Central Asia, jointly adopted by Uzbekistan and other Central Asian States on 21 September 2001, listed important objectives and short-term measures for implementation in the period 2002–2007 in terms of monitoring and information. Uzbekistan has made significant progress towards the objective set in the Plan to improve the emission monitoring system and the monitoring of surface water quality in transboundary rivers in Uzbekistan's territory. There is no evidence, however, that Uzbekistan has implemented the measures listed in the Plan related to upgrading the system to monitor the transboundary movement of air pollutants or to set up an online information exchange system and computer databanks.

Following the joint resolution of the Collegiums of the SCNP and Uzhydromet of 28 September 1998 (Resolution No. 9/1/17), a draft programme was prepared by both authorities in 2000 aimed at the development and modernization of the monitoring of atmospheric air and sources of its pollution for 2000–2005. The overall cost of programme implementation was estimated at almost US\$ 7.5 million. Although state financing was intended to be the main source of funding for programme implementation, the programme was actually prepared for potential international donors. As no donor support was found, the draft programme has not been adopted or implemented.

Public participation

Uzbekistan adopted some legal and regulatory documents promoting the principles of public access to information, including environmental information. These relate to the 2002 Law on the Principles and Guarantees of Freedom of Information, the new edition of the 2002 Law on the Appeals of Citizens, and the 2007 Cabinet of Ministers Resolution on Measures for Further Interaction of Public and State Economic Management Bodies and Local Public Authorities with Legal and Natural Persons using Information and Communication Technologies.

The 2001 Regional Environmental Action Plan for Central Asia listed a set of objectives according to which Uzbekistan and other Central Asian States had agreed to promote public access to environmental information and public participation in decision-making on environmental measures. Some progress has been made to meet these objectives. Great efforts are required in areas where no, or only slight, progress has been made. These relate to the following objectives:

- To provide consulting assistance with regard to implementing the basic provisions of the Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters (Aarhus Convention);
- To involve the local public in broad discussions when a development project is at the drafting stage;
- To involve the public in discussions on draft laws.

According to the Programme of Actions on Nature Protection (PANP) for the period 2008–2012, preparations are under way in Uzbekistan for accession to the Aarhus Convention. Much has to be done in the country to comply with the Convention's provisions, especially those related to public participation and access to justice. Detailed procedures are lacking in current legislation and regulations. Ad hoc efforts by the SCNP and some other public authorities to involve the public in decision-making are not systematic and as such do not establish a transparent and clear framework.

Environmental education

Through their Joint Order No. 242/33/79 of 7 November 2005, the Ministry of Higher and Secondary Special Education, the Ministry of Public Education and the SCNP adopted the Programme (2006–2010) and the Concept on the Development of Environmental Education, Training and Retraining of Environmental Manpower, and Perspectives of Improving the System of Professional Training. These authorities established the Coordinating Council on Environmental Education and Education for Sustainable Development. The Council meets regularly to promote efforts made by governmental institutions and NGOs to implement the programme.

Very limited progress has been made in the implementation of the above-mentioned programme.

Many specific actions established in the programme have not been implemented, in particular: the drafting of a resolution for submission to the Government on the development of continuous environmental education; the creation of an environmental education information and resource centre; the organization of a national conference on environmental education and ESD; the publication of textbooks on ESD; and the creation of museums of ecology and local lore in regional centres.

At its meeting of 31 May 2007, the SCNP Collegium discussed further measures for the improvement of environmental education in the country and considered a draft national action plan for the implementation in Uzbekistan of the UNECE Strategy for Education for Sustainable Development and the United Nations Decade of Education for Sustainable Development. In particular, it decided to strengthen the environmental training centre at the National University; to develop a programme for training and retraining environmental experts; to organize training seminars for the staff of the three public authorities; and to publish manuals for teaching the subjects of the environment and sustainable development. To date, there is no evidence that these decisions have been implemented. The national action plan on ESD has not been finalized.

The PANP envisages the development of a new concept on continuous environmental education and ESD; the introduction of the requirements of the UNECE Strategy for Education for Sustainable Development into the State Standard on Environmental Education; the publication of an information and analytical review of environmental education in Uzbekistan; and the publication of environmental textbooks and manuals for preschool education institutions, schools, vocational training institutions and universities.

3.7 Conclusions and recommendations

Uzbekistan made significant progress towards the creation of an integrated environmental monitoring system. The SCNP coordinates the monitoring activities of six public authorities under the state monitoring programmes. However, the inter-agency coordination council has not met since 2006. While Uzbekistan substantially improved the monitoring of pollution sources, the urgently needed progress was not made in developing its ambient environmental monitoring networks. Network density far from meets the requirements of national monitoring

regulations. The concentrations of a number of pollutants identified by the international community as being the most harmful to human health and the environment are not measured. Biodiversity and ecosystem monitoring remain underdeveloped in Uzbekistan. The country does not have an integrated or interconnected environmental electronic database.

Recommendation 3.1:

The State Committee for Nature Protection, in coordination with other government bodies and with the assistance of the inter-agency coordination council on environmental monitoring, should:

- (a) Enlarge the environmental monitoring networks in an optimal way to meet the requirements of monitoring regulations;*
- (b) Increase the number of parameters measured, in particular $PM_{2.5}$, PM_{10} , volatile organic compounds, polycyclic aromatic hydrocarbons and persistent organic pollutants in ambient air, and additional biological parameters in water;*
- (c) Switch gradually to automatic measurement, and improve data quality control and storage procedures;*
- (d) Make the monitoring of biodiversity an effective part of the state monitoring programme;*
- (e) Establish an integrated environmental database at the State Committee for Nature Protection which should be interlinked with the environmental databases of the other public authorities operating environmental monitoring programmes.*

Although Uzbekistan continues to apply most former USSR ambient environmental standards (MACs), it has either formally reapproved them as national standards, or slightly revised or reissued them. There is no inter-agency coordination for consultation in Uzbekistan when reviewing, developing or revising MACs. As a result, there is a disparity between the nominal MACs and their actual implementation (compliance). Since a number of Uzbek standards are below the detection threshold, it is impossible to know whether or not they are being implemented. Owing to budget limitations, many pollution parameters that should be measured according to monitoring standards are not routinely monitored.

Recommendation 3.2:

The Ministry of Health, jointly with the State Committee for Nature Protection, should review the list of maximum allowable concentrations (MACs) to limit substantially the number of regulated parameters to those that can be measured, to the

extent possible, and to make the MACs consistent with international standards and guidelines.

The SCNP regularly publishes a national report on the state of the environment and the use of natural resources and a report presenting the results of emission and discharge monitoring. The reports are largely descriptive and do not follow the UNECE Guidelines for the Preparation of Indicator-based Environment Assessment Reports in Eastern Europe, Caucasus and Central Asia endorsed at the sixth Environment for Europe Ministerial Conference (Belgrade, 2007). Uzhydromet, the Ministry of Health, the Ministry of Agriculture and Water Management and the State Committee on Geology and Mineral Resources publish the environmental data that they collect for a limited number of public authorities only. The State Committee on Statistics does not publish a regular statistics compendium on the environment. A limited number of environment-related data are published in the national Statistical Yearbook, which is distributed as a sales publication only.

Recommendation 3.3:

The Centre of Hydrometeorological Service (Uzhydromet), the State Committee on Statistics, the Ministry of Health, the Ministry of Agriculture and Water Management and the State Committee on Geology and Mineral Resources should make the environmental data that they collect and process easily accessible to the public by uploading data sets and their easy-to-read interpretations on their websites, while considerably increasing the number of copies of their current environment-related publications for wide circulation throughout the country and launching new ones, such as a freely accessible annual compendium of environmental statistics.

These public authorities and the State Committee for Nature Protection should use the UNECE Guidelines for the Preparation of Indicator-based Environment Assessment Reports in Eastern Europe, Caucasus and Central Asia endorsed at the sixth Environment for Europe Ministerial Conference (Belgrade, 2007).

Uzbekistan adopted some legal and regulatory documents promoting the principles of public access to information, including environmental information. The Law on State Ecological Expertise and the Cabinet of Ministers Resolution on the Regulations on State Ecological Expertise restrict public participation in the environmental impact assessment of proposed

activities, plans and programmes. Legislation does not provide for public participation in the issuing of environmental permits in Uzbekistan. Preparations are under way in Uzbekistan towards accession to the Aarhus Convention. Much has to be done in the country to comply with the Convention's provisions, especially those related to public participation and access to justice. Ad hoc efforts by the SCNP and some other public authorities to involve the public in decision-making are not systematic and as such do not establish a transparent and clear framework.

Recommendation 3.4:

The State Committee for Nature Protection and the Ministry of Justice, in cooperation with the representatives of civil society, should continue their work to introduce mechanisms and requirements of the Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters (Aarhus Convention) in the national legislation and regulations to make them clear, transparent and consistent.

Uzbekistan adopted the Programme (2006–2010) and the Concept on the Development of Environmental Education, Training and Retraining of Environmental Manpower, and Perspectives of Improving the System of Professional Training. However, many specific actions established in the programme have not been implemented. The national action plan for the implementation in Uzbekistan of the UNECE Strategy for Education for Sustainable Development has been under preparation since 2006. The environmental training of civil servants is not consistent or systematic.

Recommendation 3.5:

The Ministry of Higher and Secondary Special Education and the Ministry of Public Education, in cooperation with the State Committee for Nature Protection and other stakeholders, including non-governmental organizations and the mass media, should:

- (a) Speed up the finalization of the national action plan for the implementation in Uzbekistan of the UNECE Strategy for Education for Sustainable Development;*
- (b) Review the composition of the Coordinating Council on Environmental Education and Education for Sustainable Development by raising the level of representation and involving all stakeholders to make the Council an effective instrument for implementing the Strategy.*

Chapter 4

IMPLEMENTATION OF INTERNATIONAL AGREEMENTS AND COMMITMENTS

4.1 General framework for international cooperation

Political and legal framework

The basic principles of international environmental cooperation are defined in Uzbekistan's foreign policy, which embraces the principles of adherence to the norms of international law.

The 2008 Programme of Actions on Nature Protection for 2008–2012 provides the most recent framework for international environmental cooperation, which is closely linked to regional environmental protection. It aims to meet the commitments contained in ratified multilateral environmental agreements (MEAs), to participate in international programmes and projects dealing with nature protection, and to foster inter-State cooperation aimed at minimizing the negative impacts generated by transboundary pollution and the development of mechanisms for the rational use of natural resources in border areas and water basins.

It must be kept in mind that the 1992 Constitution recognizes in its preamble the “priority of the generally accepted norms of international law”, which may also include non-treaty obligations. This may lead Uzbekistan to take steps to comply with the international norms embodied in environmental treaties to which it is not a party.

Institutional framework

The State Committee for Nature Protection (SCNP), the Ministry of Agriculture and Water Management, the Ministry of Foreign Economic Relations, Investments and Trade, the Ministry of Culture and Sports and the Centre of Hydrometeorological Service (Uzhydromet) are the executing agencies of the major MEAs ratified by Uzbekistan. Table 4.1 summarizes the distribution of these governmental bodies in terms of the MEAs in question.

4.2 Global environmental agreements

Annex III provides an overview of selected MEAs and indicates the ones to which Uzbekistan is a party.

International chemicals regime

Uzbekistan is not a full party to the chemicals regime consisting of the 1998 Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade (PIC Convention), or to the 2001 Stockholm Convention on Persistent Organic Pollutants (POPs Convention); however, accession to the latter Convention is now for the third time with the Cabinet of Ministers.

The SCNP is the responsible executing agency for the POPs Convention and the 1989 Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal, while the Ministry of Foreign Economic Relations, Investments and Trade is responsible for the PIC Convention. Uzbekistan is, however, actively participating in the Strategic Approach to International Chemicals Management process. This is regarded as supporting the goal agreed at the 2002 Johannesburg World Summit on Sustainable Development of ensuring that, by the year 2020, chemicals are produced and used in ways that minimize significant adverse impacts on the environment and human health.

Convention for the Protection of the Ozone Layer

Uzbekistan showed its full engagement in ozone protection by ratifying the Montreal Amendment and the Beijing Amendment in 2006 and which entered into force in 2007. Since 2001, Uzbekistan has reduced its consumption of ozone-depleting substances (ODSs). ODS monitoring is carried out

Table 4.1: Executing agencies

Executing agency	Agreement
State Committee for Nature Protection	Convention on Wetlands of International Importance especially as Waterfowl Habitat
	Convention for the Protection of the Ozone Layer
	Protocol on Substances that Deplete the Ozone Layer
	Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal
	Convention on Biological Diversity
	Convention on International Trade in Endangered Species of Wild Fauna and Flora
	Convention on the Conservation of Migratory Species of Wild Animals
Ministry of Agriculture and Water Management	Convention on the Protection and Use of Transboundary Watercourses and International Lakes
	Convention on the Law of the Non-navigational Uses of International Watercourses
Ministry of Foreign Economic Relations, Investments and Trade	Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade
Ministry of Culture and Sports	Convention concerning the Protection of the World Cultural and Natural Heritage
Centre of Hydrometeorological Service	United Nations Framework Convention on Climate Change
	Kyoto Protocol
	Convention to Combat Desertification in Countries Experiencing Serious Drought and/or Desertification, Particularly in Africa

Source: State Committee for Nature Protection, 2009.

regularly. The destruction of illegally imported CFC-12 was also pursued. In cooperation with the State Committee on Customs, customs offices have been equipped with ODS detectors. Uzbekistan carries out activities in cooperation with international organizations to sensitize national experts and professionals on the cooling sphere.

United Nations Framework Convention on Climate Change

Under the United Nations Framework Convention on Climate Change (UNFCCC), Uzbekistan submitted the second national communication. Uzbekistan participates in the Clean Development Mechanism, as a non-Annex I Party to the UNFCCC and a non-Annex B Party to the Kyoto Protocol. The Interdepartmental Council on the Kyoto Protocol Clean Development Mechanism was established in 2007 to handle projects in the country (chapter 9).

Convention to Combat Desertification in Countries Experiencing Serious Drought and/or Desertification, Particularly in Africa

Desertification in Uzbekistan is caused by erosion, salinity, the periodic disappearance of watercourses and water reservoirs as well as the drop in the groundwater level. Under this Convention, Uzbekistan relates its main actions to the Aral Sea and the Kyzyl Kum Desert. Also in cooperation with neighbouring countries, Uzbekistan participates in a

large-scale regional project funded under the Global Environment Facility and the Asian Development Bank on the management of ground resources.

Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal

Since 1996, Uzbekistan has been a party to the 1989 Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal, without having signed its subsequent protocols. The 2002 Law on Waste regulates dangerous waste, its imports, exports and storage. Radioactive substances are also regulated by this Law. With the support of the United Nations Industrial Development Organization (UNIDO), the Clean Technologies Centre was established and 10 projects were carried out at the enterprise level. The Programme of Clean Technologies and their Introduction is being implemented. In 2007, the Senate Committee on Agrarian Issues, Water Management and the Environment approved a draft national waste management strategy and action plan for 2008–2017.

Convention concerning the Protection of the World Cultural and Natural Heritage

Uzbekistan is a party to the Convention concerning the Protection of the World Cultural and Natural Heritage of the United Nations Educational, Scientific and Cultural Organization (UNESCO), and the commitments contained therein are being

expeditiously implemented. Four properties have been inscribed on the World Heritage List for their cultural value. In 2008, more than 30 sites of cultural and natural heritage were tentatively listed, including properties of outstanding natural value, as part of the serial nomination to place the Silk Roads of Central Asia and China on the List, which forms an interesting example of exploring new forms of regional cooperation. The Chatkal State Biosphere Reserve mountains of the Western Tien Shan (transboundary nomination of Uzbekistan, Kyrgyzstan, Kazakhstan) is on the UNESCO Tentative List for consideration for nomination. The 2001 Law on the Protection and Use of Objects of Cultural Heritage was amended in 2004 and 2005, yet it still does not contain a definition of cultural or natural heritage of international significance.

Framework Convention on Tobacco Control

Uzbekistan is not a party to the 2003 World Health Organization Framework Convention on Tobacco Control, which states the following in article 18: "... Parties agree to have due regard to the protection of the environment and the health of persons in relation to the environment in respect of tobacco cultivation and manufacture...".

Convention on Biological Diversity

Uzbekistan has taken some actions on the protection of biological diversity and species protection. Under the Convention on Biological Diversity, a third national report on the implementation and effectiveness of the Convention was submitted in 2006, but the fourth national report is encountering substantial delays. The National Biodiversity Strategy and Action Plan dates from 1998 and has never been updated.

Uzbekistan is not a party to the Cartagena Protocol on Biosafety. Although the Programme of Actions on Nature Protection for 2008–2012 indicates that accession might be considered, no further action has been taken. It is also unclear who, or which ministry, is mandated to address the issue of genetically modified organisms and/or possible accession to this instrument.

According to the 2008 Red List of Threatened Species of the International Union for Conservation of Nature, which provides a comprehensive approach for evaluating the conservation status of plant and animal species, there are 52 critically endangered/

endangered/vulnerable species in Uzbekistan, while a further 415 species have a lower risk, and the data for 5 species are deficient. In 2006, Uzbekistan produced the national Red Book, which has a partial overlap with the 2008 International Red List, being more stringent in some instances. The Red List process is an element of the 1998 National Biodiversity Strategy and Action Plan. It serves as the basis for conservation action plans, bilateral and regional agreements, as well as protected area legislation and a variety of laws and acts, including on poaching.

Species protection is regulated in a fragmented way, with a great variety of actors involved in a sometimes uncoordinated manner. The concern is that, if action is not undertaken soon, more species will become extinct in Uzbekistan, which in some instances provides the critical habitat of a particular species on the global scale. Data are often lacking, and hunting sometimes continues even within protected natural areas. Unfortunately, there is little law enforcement to prevent poaching outside the protected natural areas. The anti-poaching activities of the SCNP State Inspectorate for the Protection and Rational Use of Flora and Fauna and Nature Reserves would benefit from being strengthened, and there is a need to create databases with up-to-date information, given that there is a lack of specific data and research regarding poaching.

Convention on International Trade in Endangered Species of Wild Fauna and Flora

Since ratifying the Convention, Uzbekistan has improved its legislation on the system of imports and exports, trading licences and research on endangered species. The SCNP, in cooperation with the State Committee on Customs, ensures strict border controls. Special attention is given to some bird species. A hotline was created for reporting violations.

Convention on the Conservation of Migratory Species of Wild Animals

Uzbekistan paid special attention to migratory species due to the fact that migratory species cross its territory. Two memorandums of understanding have been developed under the umbrella of this Convention. At the international level, agreements such as the 2005 Memorandum of Understanding concerning the Conservation, Restoration and Sustainable Use of the Saiga Antelope (*Saiga tatarica tatarica*), a critically endangered species included in the national Red List since 2008, was signed by Uzbekistan in 2006,

as well as the 2002 Memorandum of Understanding concerning the Conservation and Restoration of Bukhara Deer (*Cervus elaphus bactrianus*). Four ornithological protected natural areas (zakaznik)¹ and a protected area for the protection and migration of Saiga Antelope were established.

Under the auspices of the Convention, Uzbekistan participates in the protection of the Siberian Crane and is considering joining the Agreement and Action Plans for the Protection of the Houbara Bustard. It also signed the Agreement on the Conservation of African-Eurasian Migratory Waterbirds in 2004.

Convention on Wetlands of International Importance especially as Waterfowl Habitat

Two wetland sites of international importance (totalling 558,400 ha) are listed under this Convention: Lake Dengizkul (31,300 ha) in 2001 and the Aydar Arnasay Lakes System (about 350,000 ha) in 2008; other sites are currently being considered for the list. Accession to the Convention was used to develop projects in wetland areas, such as with the Global Environmental Facility, the WWF and the World Bank.

In its first national report prepared for the Conference of the Parties in 2008, Uzbekistan indicated that a number of issues still required attention and improvement. This was especially the case for data collection, assessment and management, including, for example, site management effectiveness and national coordination with other MEA focal points. Also, the relationship with the protected area governance structure and species protection needed to be developed, as well as the establishment of a national wetland policy.

Participation in international forums

Uzbekistan has been regularly attending meetings of the main bodies of MEAs. However, often it is not sufficiently clear beforehand who will be attending these meetings, which makes national and regional coordination difficult and effectively hampers Uzbekistan's contribution to a favourable outcome of such intergovernmental forums. Furthermore, national

reporting obligations under MEAs are not always adhered to in a timely and comprehensive manner.

4.3 Regional cooperation

United Nations Economic Commission for Europe

The United Nations Economic Commission for Europe (UNECE) administers the five environmental conventions that have been negotiated under its auspices, namely the 1979 Convention on Long-range Transboundary Air Pollution (Transboundary Air Pollution Convention); the 1991 Convention on Environmental Impact Assessment in a Transboundary Context (Espoo Convention); the 1992 Convention on the Transboundary Effects of Industrial Accidents; the 1992 Convention on the Protection and Use of Transboundary Watercourses and International Lakes (Water Convention); and the 1998 Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters (Aarhus Convention). Uzbekistan is party to only one of these five UNECE Conventions: the Water Convention (section 4.7).

The first Environmental Performance Review (EPR) included the recommendation that Uzbekistan join the five UNECE conventions (at that time, the Water Convention had not yet been ratified). The national processes that may lead to accession to the four remaining conventions are currently at various stages. Accession to the Espoo Convention is expected to take place in 2009. Although the 2008 Programme of Actions on Nature Protection for 2008–2012 refers to the importance of preparing and drafting the documents required for accession to the Aarhus Convention, there is no indication that such accession is imminent.

Owing to their transboundary nature, the UNECE conventions require more political cooperation among the Central Asian countries than the global MEAs. For some UNECE conventions, there is uncertainty at the government level concerning what accession would entail in practice, including for the national stakeholders concerned and the financial implications. Although Uzbekistan has not yet acceded to the four other UNECE conventions, the country has to a certain degree implemented them. Uzbekistan regularly participates in intergovernmental and sometimes expert meetings of the UNECE conventions to which it is not a party, and in this

¹ Protection regime of a zakaznik: clear cutting, the drainage of wetlands and use of chemical substances, which have a devastating impact on natural ecosystems, are strictly prohibited. The collection of berries, mushrooms and firewood, the cutting of hay, tourism and fishing are all permitted.

observer role it sometimes influences the formation of the legal regime.

Convention on Long-range Transboundary Air Pollution

The ratification process has not been started. However, the ratification of the Transboundary Air Pollution Convention and its 1999 Gothenburg Protocol to Abate Acidification, Eutrophication and Ground-level Ozone would help Uzbekistan to identify specific measures to cut the emissions of air pollutants through scientific collaboration and policy negotiation. Among the Central Asian countries, only Kazakhstan and Kyrgyzstan have ratified the Convention. Ratification would help establish a dialogue platform to foster relationships with these two countries in transboundary air pollution.

Convention on the Transboundary Effects of Industrial Accidents

The Convention was adopted in 1992 and entered into force on 19 April 2000. The aim of the Convention is to help its parties to prevent industrial accidents that can have transboundary effects, to prepare for them and to respond accordingly. The Convention also encourages its parties to assist each other in the event of such an accident, to cooperate on research and development, and to share information and technology. Kazakhstan is the only country in the Central Asian region to have acceded to the Convention. However, Uzbekistan is not altogether on the sidelines. It fully participated in the High-level Commitment Meeting organized by the Convention secretariat in December 2005, which was aimed at ensuring a common understanding on the national level obligations required to implement the Convention. The Meeting adopted a declaration that includes a commitment towards the implementation of the Convention and paved the way for setting up a national assistance programme.

Subsequently, a fact-finding team visited Uzbekistan in July 2007. It concluded that Uzbekistan has already to a great extent implemented many of the Convention's basic requirements and recommended the main outstanding tasks, as follows: (1) to designate an authority responsible for notifying neighbouring countries of hazardous activities; and (2) to implement the Industrial Accidents Notification System as soon as possible. Consequently, the country could enter the next phase of the programme and actively work on implementing the Convention's

more complex requirements, receiving assistance when needed.

Then, in February 2009 a new focal point was nominated in the Ministry for Emergency Situations; and the Industrial Accidents Notification System is progressing. Full accession to the Convention is, however, dependent on sensitive prevention and notification issues, for which Uzbekistan emphasizes the need for reciprocal measures.

In the meantime, in April 2007, Cabinet of Ministers Decision No. 71 puts in place a government programme on foreseeing and preventing emergency situations and creating a government-wide commission including all ministries and agencies to deal with emergencies, including natural emergencies.

Environment for Europe process

Uzbekistan participates in the Environment for Europe process. The SCNP is involved in the activities of the Working Group on Environmental Monitoring and Assessment of the UNECE Committee on Environmental Policy.

In cooperation with the United Nations Development Programme, the list of national ecological indicators had been developed based on indicators developed under the Working Group. On the basis of the national ecological indicators, the Environmental Information System (EIS)² for Uzbekistan was launched. The EIS is a comprehensive source of environmental information. Through the EIS website it is possible to query, analyse and display Uzbekistan's environmental monitoring data online. Two publications were issued: the Environmental profile of Uzbekistan for 2008 Based on Indicators and the Environmental Atlas of Uzbekistan. No data have been processed since the website was established, and the website displays data until 2006 only (chapter 3).

Economic and Social Commission for Asia and the Pacific

Among the various Economic and Social Commission for Asia and the Pacific (ESCAP) initiatives, the Phnom Penh Regional Platform on Sustainable Development for Asia and the Pacific was developed at the 2001 Preparatory Meeting for

² Refer to EIS website at: <http://eis.uznature.uz>.

the World Summit on Sustainable Development and identified the region's general priorities: globalization, urbanization, water management, local governance and environmental governance. The platform takes into consideration all Central Asian initiatives. The main objectives are to establish a Central Asian regional system of ecological safety; a system of transboundary pollution prevention; a unified network monitoring system; a regional early-warning system; the rehabilitation of tailing pounds; and the introduction of environmentally friendly technologies.

Economic Cooperation Organization

Uzbekistan is a member of the Economic Cooperation Organization (ECO), an intergovernmental regional organization established in 1985 by the Islamic Republic of Iran, Pakistan and Turkey for the purpose of promoting economic, technical and cultural cooperation among its Member States³. The Directorate of Energy, Minerals and Environment is responsible for coordinating environmental activities. The Organization works in close cooperation with ESCAP.

Shanghai Cooperation Organisation

The Shanghai Cooperation Organisation is an intergovernmental mutual-security organization which was founded in 2001 by China, Kazakhstan, Kyrgyzstan, the Russian Federation, Tajikistan and Uzbekistan. The main goals of the Organisation are to strengthen mutual confidence and good neighbourly relations among the member countries; to promote effective cooperation in politics, trade and economy, science and technology, culture, education, energy, transportation, tourism, environmental protection and other fields; and to make joint efforts to maintain and ensure peace, security and stability in the region, moving towards the establishment of a new, democratic, just and rational political and economic international order.

Other treaties

With regard to new legal instruments, Uzbekistan signed in 2006 and ratified in 2007 the Central Asian Nuclear-Weapon-Free Zone Treaty, which entered into force in 2009. The Treaty includes references to the environmental rehabilitation of territories affected

by radioactive contamination resulting from past activities.

Uzbekistan has also been involved in the negotiations, but has not yet acceded to, the 2006 Framework Convention on Environmental Protection for Sustainable Development in Central Asia. The objective of the Convention is to ensure effective environmental protection for sustainable development in the Central Asian region, including the enhancement of the environmental situation, the rational use of natural resources, as well as a reduction in and the prevention of transboundary environmental damage, by way of harmonizing and coordinating the policies and actions of the contracting parties and establishing mutual rights and obligations. The Convention has not yet entered into force since all five countries need to ratify it, and currently only three countries have signed the instrument (Kazakhstan and Uzbekistan have not yet done so). The future of this Convention is unclear at the moment. If the Convention enters into force, it would set a very meaningful framework to intensify regional environmental cooperation.

4.4 Bilateral cooperation

Uzbekistan has concluded a variety of bilateral agreements with environmental components with China, Georgia, India, Israel, Japan, Kazakhstan, Kyrgyzstan, Malaysia, the Republic of Korea, Slovakia, Switzerland, Tajikistan, Thailand, Turkey, Turkmenistan and Ukraine. Since the first EPR, bilateral agreements have been concluded with Azerbaijan (2006), Kuwait (2008) and the United Arab Emirates (2006). In 2007, a memorandum of mutual understanding between Uzbekistan and China was signed on cooperation in environmental conservation and wildlife management. A memorandum of mutual understanding between Uzbekistan and the United Arab Emirates (UAE) on cooperation in environmental protection was signed in 2008 and a draft action plan was developed by Uzbekistan and submitted to the UAE for consideration.

Cooperation with the European Union/ European Community

Furthermore, cooperation with the European Union (EU) has been strengthened. The performance of the 1999 Partnership and Cooperation Agreement between the European Communities and their Member States and Uzbekistan was positively

³ Current membership: Afghanistan, Azerbaijan, the Islamic Republic of Iran, Kazakhstan, Kyrgyzstan, Pakistan, Tajikistan, Turkey, Turkmenistan and Uzbekistan.

reviewed by the Cabinet of Ministers in 2004 and forms the basis for the realization of projects with EU Member States. The European Community assistance from 1991 to 2006 amounted to €228.85 million.

Education is a key priority for all five Central Asian countries. In particular, 2008 was designated the “Year of Youth” in Uzbekistan. The EU considers cooperation with Uzbekistan to be an area from which many potential benefits could result. European Commission programmes, such as Tempus, and bilateral exchange programmes with Member States are well-established in the region.

The European Community Regional Strategy Paper for Assistance to Central Asia for the Period 2007–2013 emphasizes cooperation in environment-related matters, emergency response and activities under the Technical Assistance to the Commonwealth of Independent States (TACIS). The paper underlines the following environmental key areas: water management and quality, waste management, nature protection and land use.

Uzbekistan, as the other Central Asian countries, is subject to natural disasters, seismic activity and droughts. All countries have emergency-response institutions and progress has been made in addressing dam safety, which has hitherto heightened the risk of flooding in the region. Since 2003, the European Community has also funded disaster preparedness action plans for Central Asia. More coordinated approaches at both the national and regional levels are required to promote better cross-border contingency planning.

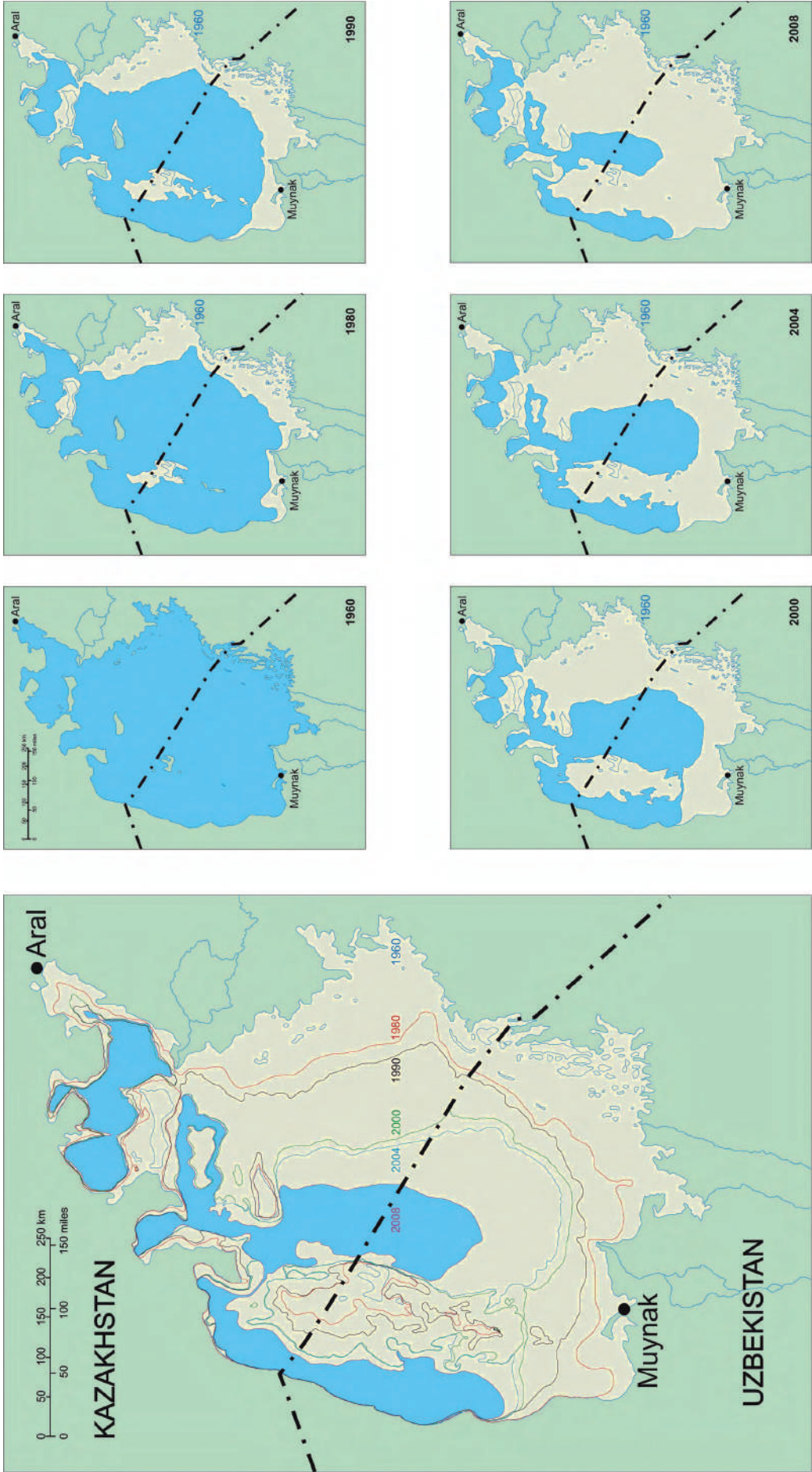
Similarly, TACIS has also been instrumental in supporting the Central Asian Initiative for Sustainable Development concerning environmental issues, which is now being promoted by the five Central Asian countries as a common basis for harmonized environmental policies across the region. As regards cross-border river basin management, the projects supported by TACIS on a bilateral or trilateral basis have helped to develop a more comprehensive concept of integrated water management, which is gradually being taken into account by the countries of the region. TACIS regional and Central Asian programmes have been effective in many cases in creating a system of regional networks or mechanisms enabling the joint identification of priorities and mutual interest projects, for example, in transport, energy and the environment across the Eastern Europe, Caucasus and Central Asia (EECCA) region.

TACIS regional cooperation has acted as a catalyst for the establishment of new regional mechanisms, such as the Transport Corridor Europe-Caucasus-Asia (TRACECA) Intergovernmental Conference, the Framework Convention for the Protection of the Marine Environment of the Caspian Sea and the Task Force for the Implementation of the Environmental Action Programme for Central and Eastern Europe, which have reached a substantial level of maturity and have every prospect of becoming self-sustained processes in the future. By making it possible to share best practices and lessons learned among partners, by promoting the harmonization of measures and offering related capacity-building, EU regional programmes have enhanced the pace and sustainability of reform processes across the whole region in the sectors concerned.

4.5 Millennium Development Goals and sustainable development

Following the 2000 United Nations Millennium Declaration, Uzbekistan formulated its own national targets and indicators related to the Millennium Development Goals (MDGs). Chapter 1 provides details on how Uzbekistan’s Welfare Improvement Strategy for 2008–2010, approved in September 2007, addresses the MDGs. In the second half of 2003, the process of formulating country-specific development goals began with the involvement of the Government, civil society and the international community. In 2006, a national MDG report was published, jointly prepared by Uzbekistan and the United Nations Country Team. The aim of the report was to reflect on current trends and prospects for Uzbekistan’s development and facilitate the monitoring of progress towards achieving the MDGs at the country level. The MDGs represent a “package” and, although for this review all MDGs are relevant, Goal 7 (Ensure environmental sustainability) is particularly important. Regarding this Goal, Uzbekistan identified two national targets: (1) integrate the principles of sustainable development into country policies and programmes and reverse the loss of environmental resources by 2015; and (2) increase the share of the urban and rural population with access to an improved water source and sanitation by 2015. The report concludes that the national goal to ensure environmental sustainability by 2015 can be potentially met. Uzbekistan’s national goals and targets upon which the report is based are very similar to the global goals; however, the global target of reducing biodiversity loss was regrettably not adapted to the national level.

Map 4.1: Aral Sea 1960–2008



Source: UNECE work, NASA images, the United States National Imagery and Mapping Agency data and www.unimaps.com.
Note: The boundaries and names shown on this map do not imply official endorsement or acceptance by the United Nations.

In general, not much progress has been made in Uzbekistan for the indicators associated with Goal 7 for the period 2001–2009, as far as can be deduced from the available published data. For example, the percentage of terrestrial and marine areas protected compared to the total territorial area remained the same: 8,086 km² (1.9 per cent), and the proportion of land area covered by forest increased in this period by 0.2 per cent (from 7.8 to 8 per cent). More importantly, although the target of providing access to improved sanitation facilities shows an increase from 51 per cent in 1999 to 67 per cent in 2005, the target of providing access to an improved water source shows a net decrease from 94 per cent in 1990 to 82 per cent in 2005.

Although environmental sustainability is being incorporated in most development strategies and action plans, actual implementation still requires further improvements. Uzbekistan can potentially achieve the MDG environmental sustainability targets. Progress, however, has been very slow, largely due to the lack of political will and commitment to institutionalize and effectively implement measures on environmental protection. Community involvement, and data collection and availability, could also be improved. The United Nations Country Team has started the Common Country Assessment and the United Nations Development Assistance Framework process for the period 2010–2014, cooperating closely with national partners to implement the Welfare Improvement Strategy and maximize MDG achievements by 2015.

On the regional scale, the Interstate Commission for Sustainable Development (ICSD) was established in 1994 with a rotating chairmanship of environment and economy ministers of Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan and Uzbekistan, non-governmental organizations and other institutions from the Central Asian region, falling under the umbrella of the International Fund for Saving the Aral Sea. All countries are usually represented at the ministerial meetings. The ICSD designed a subregional sustainable development strategy for Central Asia, a final draft of which was finalized in February 2009: the ICSD Regional Environment Plan for Central Asia and the Subregional Strategy for Sustainable Development in Central Asia. At its meeting of 26 May 2009, the ICSD decided to hold a “concept launching” of its regional action plan and to engage in further participation in international initiatives and forums. The ICSD also negotiated

the 2006 Framework Convention on Environmental Protection for Sustainable Development in Central Asia, as described above in section 4.3. In addition, the ICSD supported the establishment of the Regional Mountain Centre in Bishkek, set up with a view to protecting mountain ecosystems, ensuring the proper use of natural resources and dealing with the socio-economic issues of mountain area communities.

4.6 Special focus: transboundary waters

With the break-up of the Soviet Union and the emergence in its place of a number of independent countries, many previously internal aspects of the management, sharing and protection of water resources assumed a transboundary character. The new situation called for new approaches to the regulation of water management relations between sovereign States, including the establishment of an adequate international legal framework for cooperation. Uzbekistan attaches great importance to international cooperation in the field of transboundary waters, since, in terms of the availability of water resources, Uzbekistan, as a downstream country, depends on upstream countries.

Uzbekistan acceded to the 1992 Convention on the Protection and Use of Transboundary Watercourses and International Lakes in 2007, though not to its amendments or additional protocols on water and health, and civil liability. On the same day, 4 September 2007, it acceded to the 1997 Convention on the Law of the Non-navigational Uses of International Watercourses, as one of the 17 countries to have done so to date.

In Central Asia’s water sector, it is essential that new projects such as hydropower facilities and other infrastructure with significant effects on the water flow downstream, and thus their possible impact on ecosystems, be communicated to and discussed with neighbouring countries. Regional cooperation to ensure the safe operation of dams and other water installations starts at the planning stage. The assessment of the environmental impact of facilities and activities at an early phase of planning, including their cross-border impact, is a well-recognized procedure in modern environmental policy and an important prerequisite for good neighbourly relations between countries. The UNECE Convention on Environmental Impact Assessment in a Transboundary Context can provide an important legal basis for such dialogue and cooperation.



Former bed of the western part of the Aral Sea

Transboundary water resources constitute an indivisible natural system. At the same time, they are “shared” between different States, with each State exercising sovereignty over the part of the resource situated within its territory. The fundamental rule of the legal regime of transboundary waters is the principle of “reasonable and equitable utilization”, according to which each State of the basin has the right within its own territory to a reasonable and equitable share in the use of the waters of that basin.

Equitable water resource sharing remains a major challenge for the Central Asian region. The two most important rivers, the Amu Darya and Syr Darya Rivers, are both crucially important for the water supply not only in Uzbekistan, but also in Kyrgyzstan, Tajikistan (these two being the upstream countries), Kazakhstan and Turkmenistan. Upstream use determines downstream options in water management, setting the stage for disputes or cooperation.

These two rivers are also the most important water sources feeding the Aral Sea, a landlocked basin shared by Kazakhstan and Uzbekistan. By 2007, the Aral Sea had shrunk to 10 per cent of its original surface area, splitting first into two, then three, separate lakes: the North Aral Sea and the South Aral Sea, with the latter splitting into eastern and western basins in 2003 (map 4.1).

The loss of the North Aral Sea in Kazakhstan has since been partially reversed. The Kok-Aral Dam project completed in 2005 has raised the water level of this lake by 8 metres. Salinity has dropped and fish are once again found in its waters. The construction of a second dam is planned to start in 2009. In Uzbekistan, no such positive development can be reported. A sluice on top of the Kok-Aral Dam is intended to send any excess water to the South Aral Sea, largely within Uzbekistan. However, its surface area is still shrinking, and the pollution and increased salinity have killed most of its natural flora and fauna and continue to have a negative impact on human health. This situation is not expected to change if the amount of irretrievable water intake from the Amu Darya River is not reduced. At the national level, less emphasis on water-intensive cotton production would be beneficial for the restoration of the Aral Sea.

In 1993, the intergovernmental International Fund for Saving the Aral Sea (IFAS) was established, with the goal of undertaking and financing joint inter-State ecological and scientific programmes and projects aimed at recovering the Aral Sea. In 2008, the IFAS was granted observer status with the United Nations General Assembly. The Interstate Commission for Water Coordination (ICWC) is an intergovernmental organization created by the signing of the 1992 Agreement concerning cooperation in the joint management, use and protection of inter-State sources

of water resources. The main aim of the ICWC is to strengthen collective leadership and make decisions on regional inter-State water management, use and protection and in implementing joint programmes. The ICWC took over the responsibility for the water resources management of both basins directly from the former Ministry of Amelioration and Water Resources of the Union of Soviet Socialist Republics. ICWC decisions are binding for Central Asian countries.

Both the IFAS and the ICWC have addressed the issue of the Aral Sea and its economic and ecological aspects. The Heads of State have adopted rather general declarations at their meetings. At the latest meeting of the Heads of the IFAS founding States, held on 28 April 2009, it was emphasized that the plight of the Aral Sea is not limited to the Central Asian region. The critical state of water and energy systems in Central Asia threatens future economic development as well as the environmental and social stability of the region.

A variety of projects have been funded to improve the Aral Sea conditions, for example, under the Global Environmental Facility, TACIS, the World Bank and with individual donors. However, in view of the ever-worsening situation of the Aral Sea basin in Uzbekistan, it can be concluded that the institutional set-up, the policies adopted and the legislation in place, as well as the projects undertaken, have not yet led to improvements, and are far from achieving the desired results.

Uzbekistan has shifted its attention away from restoring the Aral Sea and towards creating a series of lakes to its south in order to gain microclimate benefits, and to combat erosion, desertification, deforestation and the loss of biodiversity, in line with the Intergovernmental Concept for Saving the Aral Sea Littoral Zone, adopted by the Heads of the Central Asian States in 1994. They recognized that, under current conditions, it would be impossible to restore the Aral Sea itself, and agreed to save its littoral zone.

4.7 Conclusions and recommendations

Legislation for the preservation of protected species is fragmented and coordination among the numerous actors involved is not efficient. Without effective and quick action, more species will become extinct within the country's territory. Data are often lacking, and hunting sometimes continues even within

protected natural areas. Unfortunately, there is little law enforcement to prevent poaching outside the protected natural areas.

Recommendation 4.1:

The State Committee for Nature Protection should:

- (a) Develop a comprehensive programme to protect biodiversity in accordance with the requirements stipulated in the relevant international agreements, especially the Convention on Biological Diversity;*
- (b) Update and implement its 1998 National Biodiversity Strategy and Action Plan.*

Among and within executing agencies, the focal points for particular multilateral environmental agreements (MEA) are not clearly identified. Neither are alternate focal points clearly designated, including for MEAs to which Uzbekistan is not a party. The focal points of related MEAs are not designated within the same executing agency. Although focal point tasks include attending Conference of the Parties meetings and other relevant regional preparatory meetings, the coordination of related activities at the national level, for example liaising with national experts, is not satisfactory.

National reports, in line with the obligations under MEAs, are not comprehensive enough or submitted on time. The executing agency designated as the focal point for a particular MEA does not have the authority to request technical assistance through the MEA secretariat in order to facilitate access to, compliance with or the implementation of the MEA in question.

Recommendation 4.2:

The State Committee for Nature Protection, in cooperation with agencies involved in international environmental matters, should develop a coordinating mechanism for designating focal points in order to facilitate coordination and information exchange.

UNECE conventions require more political cooperation than the global MEAs. Uzbekistan has ratified the Water Convention and is in the process of ratifying the Espoo and Aarhus Conventions. The ratification of the UNECE Transboundary Air Pollution Convention would help Uzbekistan to identify the specific measures to be taken to cut air pollutant emissions through scientific collaboration and policy negotiation. It would also be part of the Cooperative Programme for Monitoring and Evaluation of the Long-range Transmission of

Air Pollutants in Europe (EMEP) network on air pollution.

Furthermore, Uzbekistan shows its interest through regular participation in the meetings of the Convention on the Transboundary Effects of Industrial Accidents. Uzbekistan, as part of different administrative regional organizations, is also involved in early-warning systems. A fact-finding team visited Uzbekistan in July 2007 and concluded that Uzbekistan has already to a great extent implemented many of the Convention's basic requirements. Subsequently, the country could enter the next phase of the programme and actively work on implementing the Convention's more complex requirements, receiving assistance when needed. The Cabinet of Ministers approved a government programme on foreseeing and preventing emergency situations and creating a government-wide commission including all ministries and agencies to deal with emergencies, including natural emergencies.

Recommendation 4.3:

The responsible ministries should further comply with the substantive elements as incorporated in the Convention on Long-range Transboundary Air Pollution and the Convention on the Transboundary Effects of Industrial Accidents.

The Cabinet of Ministers should decide to accede to these two UNECE conventions and to the Geneva Protocol on Long-term Financing of the Cooperative Programme for Monitoring and Evaluation of the Long-range Transmission of Air Pollutants in Europe (EMEP Protocol) under the framework of the Convention on Long-range Transboundary Air Pollution.

Uzbekistan has also participated in negotiations on the Stockholm Convention on Persistent Organic Pollutants (POPs). Of all the major global conventions only the Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade remains outside Uzbekistan's field of interests.

Recommendation 4.4:

The Cabinet of Ministers should decide to accede to the Stockholm Convention on Persistent Organic Pollutants and the Rotterdam Convention on Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade.

Central Asian countries are locked in a web of hydrological interdependence. A balance of interests of all States in the region is urgently needed. Uzbekistan has not yet accessed the 2006 Framework Convention on Environmental Protection for Sustainable Development in Central Asia, which could be considered an important framework to intensify regional environmental cooperation. The objective of the Convention is to ensure effective environmental protection for sustainable development in the Central Asian region, including the enhancement of the environmental situation, the rational use of natural resources, as well as a reduction in and the prevention of transboundary environmental damage.

Recommendation 4.5:

The Cabinet of Ministers should accede to the Framework Convention on Environmental Protection for Sustainable Development in Central Asia so as to foster regional cooperation, especially on environmental matters.

***PART II: ECONOMIC INSTRUMENTS AND
FINANCIAL RESOURCES***

Chapter 5

ECONOMIC INSTRUMENTS AND EXPENDITURES FOR ENVIRONMENTAL PROTECTION

5.1 Institutional and policy framework

The first Environmental Performance Review (EPR) of 2001 described the system of regulatory and economic instruments available for environmental purposes. These included emission charges (air pollution, wastewater discharges and waste disposal), user charges, taxes on the extraction and use of natural resources and penalties and compensation for environmental damage. The legal basis for economic instruments and payments for nature protection is established in the 1992 Law on Nature Protection. Article 33 of the Law lists all these instruments, including the possibility of using tax advantages and credit subsidies for the introduction of resource-saving technologies.

New instruments have not been introduced in the period since the last review. However, there have been changes to the rules that determine the calculation of payments under existing instruments including privileges, and the allocation of revenues among different territorial levels.

The State Committee for Nature Protection (SCNP) is the leading agency responsible for state policy and the coordination of other ministries and departments for environmental issues. The SCNP administers the system of environmental funds, which play an important role in channelling resources for environmental spending purposes. It can also initiate actions following environmental damage. The SCNP is directly supervised by the Senate, which serves to underline its independence, enhancing its profile and underlining the cross-sector dimension of environmental issues. Despite its efforts, the effectiveness of SCNP actions is limited by staff and funding constraints.

Supervision and control of the water used for irrigation are carried out by the Ministry of Agriculture and Water Management. The State Committee on Geology and Mineral Resources prepares programmes for the use of natural

resources and monitors geological processes with environmental implications. The State Committee on Land Resources, Geodesy, Cartography and State Cadastre monitors land use. The information thus collected serves as a basis to determine land taxation and other payments. Price regulation powers are ultimately vested in the Ministry of Finance. The government agency responsible for communal services (Uzkommunkhizmat) has responsibilities that include coordinating interregional water pipes and attracting investments to the sector. Municipal waste issues are dealt with by local authorities.

All new construction projects and foreign traded products are evaluated to assess their environmental impact. Enterprises must keep documentary evidence of the emission and discharge of harmful substances into the environment and the use of natural resources.

The 1998 National Environmental Action Plan (NEAP) envisaged the strengthening of market-based incentives for environmental management and identified the development of environmental and natural resources management as one of its priorities. The NEAP was followed by the 1998 Programme for Environmental Protection and the Rational Use of Natural Resources for 1999–2005 and the 2008 Programme of Actions on Nature Protection for 2008–2012. Ministries, agencies and state committees, regional authorities and other public entities can submit proposals to the Ministry of Economy and the Ministry of Finance to undertake measures to fulfil this programme of actions and, accordingly, for the inclusion of these activities in the annual state investment programme.

The integration of economic and environmental policies has been declared a basic objective in the country's development plans. Both the Living Standards Improvement Strategy for the Population of Uzbekistan 2004–2006 and up to 2010 and the Welfare Improvement Strategy for 2008–2010 have identified strong linkages between environment, health and economic prospects. However, a

comprehensive assessment of the economic and social costs of environmental degradation has not yet been carried out. The Welfare Improvement Strategy envisages the development of two major strategies to promote environmental sustainability: an environmental security strategy and a strategy for renewable energy resources. Despite some progress in policy formulation, there is still further scope for a more effective integration of environmental priorities in mainstream economic development plans, policies and programmes.

5.2 Use of economic instruments for environmental objectives

Taxes

The basis for the taxation of natural resources and the use of land can be found in the Law on Nature Protection. According to the Law, rates are determined on the basis of quality, rarity, reproduction possibilities, location and a number of other factors, including the existence of exploitation limits defined by the legislation.

According to the 2007 Tax Code, there are taxes on the use of water resources, as well as a land tax and various taxes for the use of subsoil resources. In addition, the use of fuel for transport by physical persons is also subject to taxation. This tax is levied on the retailers of petrol, diesel and gas based on the amounts of fuel sold to individuals (see the section on transport).

The commercial use of water is taxed; however, there are exemptions such as those applicable to desalinization activities. For enterprises that supply water for the population, only the water that they use for their own needs is subject to this tax. Although the water tax is defined at the national level, since 2008, revenues accrue to local budgets. Rates are very low, yet there has been some discussion as to whether to increase them substantially to encourage

more efficient water use. There is a distinction according to the types of activities, with the lower rates being applied to agrarian enterprises that do not pay the single land tax, *dekhan* (small family) farms and individuals who exert an entrepreneurial activity. Underground water is charged at higher rates than surface water. For agrarian activities, the difference in rates is particularly small (1.3 sum and 1.1 sum per cubic metre, respectively, in 2009). The tax is levied at the place where the water is used, not from where it originated.

The land tax applies to commercial land use, being subject to numerous exemptions and benefits, which in some cases seek to reward more productive uses. For agricultural enterprises that benefit from the single land tax (including payments from other taxes, namely the water tax), tax liabilities have been assessed since 2004 on the basis of normative values of the land. These are defined according to existing productive specialization. For other types of agrarian taxpayers, land quality scores are used.

Subsoil users, except those operating under production sharing agreements, are subject to three types of taxes: subsoil use tax, excess profit tax and signing and commercial exploration bonuses. The base of the subsoil use tax is the value of the mineral resources processed or extracted, with rates that depend on the types of minerals concerned. Excess profit tax is levied on enterprises producing or extracting cathode copper, cement, polyethylene granules and natural gas. The tax base is the difference between the selling price and a normative price defined by annual budget legislation. In 2009, the applicable rates are 60 per cent for cathode copper and 75 per cent for all the rest. (2008 Presidential Decree on the Forecast of Basic Macroeconomic Indicators and Parameters of the State Budget). Bonuses are one-off payments.

In addition to the taxes mentioned earlier, an environmental tax was introduced in 1998, equivalent to 1 per cent of enterprises' total costs. As of January

Table 5.1: Environmental revenues as a percentage of GDP, 2003–2008

	2003	2004	2005	2006	2007	2008
Fuel consumption tax	0.40	0.41	0.46	0.37	..	..
Land tax	0.53	0.59	0.58	0.54	0.56	0.50
Subsoil tax	0.31	0.46	2.33	2.35	2.18	2.39
Water tax	0.09	0.09	0.09	0.09	0.10	0.10
Environmental tax	0.63	0.64	0.75	0.10	..	..

Source: Ministry of Finance, 2009 (website access); State Tax Committee, direct communication, 2009.

Table 5.2: Percentage increases in natural resources taxation, 2004–2008

	2004	2005	2006	2007	2008
Water tax	30	30	50	50	20
Land tax	..	30	50	50	20
Fuel consumption tax	..	25	20	33	25

Source: International Monetary Fund, 2008.

2001, revenues from this tax started to accrue to local budgets. However, despite the name, the resources raised through this tax were not used for environmental purposes. It could not be considered an economic instrument for environmental purposes, since it was applied in a general manner, without discriminating between activities according to their environmental impact. The environmental tax was abolished in 2006 as part of a general policy to reduce the tax burden on businesses which also included cuts in the corporate tax rate (down to 10 per cent in 2007, from 18 per cent in 2004). Some due revenues from this tax were still raised in 2007.

All these taxes are primarily aimed at raising revenues, capturing part of the economic rents involved in the exploitation of these natural resources. Receipts accrue to the general budget, and the influence of these taxes in resource management is limited (table 5.1).

Although revenue from water use and land taxes remained fairly stable in the period 2001–2008 as a percentage of GDP, land tax revenues fell in 2008. Revenues from the subsoil use tax have grown markedly since 2005. This increase in revenues was partly explained by the hike in the rate on natural gas, which rose from 18.5 per cent in 2004 to 58 per cent in 2005, before declining to 30 per cent in 2006.

The rates of natural resources taxes are defined each year in the annual budget. As part of far-reaching tax and treasury reforms, the authorities have reduced rates on profit and income taxes, while increasing those on natural resources (table 5.2).

Emission charges and other payments

Concept and calculation

Pollution charges are levied on air and water pollution and the discharge of waste. Rates are established by the Cabinet of Ministers according to the proposals made by the SCNP. In addition, there are payments for the special use of natural resources (flora and

fauna); however, these are not used for environmental purposes.

National legislation establishes a distinction between pollution within and above established limits. These limits are defined for each enterprise on the basis of maximum allowable concentration (MAC) requirements, although some exceptions are made in view of technological possibilities. Enterprises calculate their emissions on the basis of existing technology and actual production levels and maintain extensive primary reporting data records. Occasionally, these are checked by laboratory tests carried out by the SCNP. Emissions and discharges presuppose the existence of a permit that defines limits for various pollutants and types of wastes. The absence of such a permit means that total compensation payments are increased tenfold.

In accordance with the 1996 Concept on the Gradual Introduction of Scientifically-based, Economic and Legal Mechanisms for Nature Use, a gradual introduction of payments for environmental pollution and disposal of waste, both below and above limits, was envisaged. This process was intended to be concluded by 2010. Following the introduction of payments for pollution above limits in 1992 (first stage), payments for pollution within and above normative limits were established in 2000 (second stage), just before the first EPR was carried out.

Payments are made to the environmental funds corresponding to where the pollution took place (section 5.4). Pollution charges are not considered a business cost, in which case they would be deducted from profits for tax purposes. Instead, companies have to pay them directly from their profits. These payments do not exonerate polluters from the obligation to address the consequences of any environmental damage that they may have caused.

Since then, the two most significant reforms of the system of pollution charges have taken place. The first one took place in 2003, following the 2003 Cabinet of Ministers Resolution on the Improvement

of the System of Payments for Environmental Pollution and Waste Disposal. In 2006, further changes were introduced by the 2006 Resolution on the Improvement of the System of Payments for Special Nature Use. An additional stage of the reform is envisaged after 2010, when further developments of the system of payments for the special use of natural resources are planned. This will establish payments for the non-rational use of natural resources, including water, land and forest resources, thus increasing the scope of economic instruments for environmental management.

Charges for emissions from mobile sources are calculated on the basis of the consumption of different types of fuels. The legislation established some rules to estimate fuel consumption, if necessary, on the basis of various assumptions regarding the use of vehicles and the consumption per distance travelled. Pollution charges on waste depend on the degree of toxicity. For non-toxic waste, there is a differentiation according to user types. This concerns not only the rates applied, but also how waste is measured: on a volume basis for manufacturing, and according to weight for extractive industries. According to the 2003 reform, limits on non-toxic waste are calculated based on estimates that use different types of indicators (such as the number of workers, customers or the size of facilities) for different types of economic activities.

A number of users have benefited from special treatment regarding compensation payments for environmental pollution and waste disposal. In some cases, these privileges have been devised as transitory mechanisms to soften the impact of the introduction of generalized pollution charges (including emissions and discharges within the limits).

According to the 2003 reform, housing and communal services pay 20 per cent of base rates, up from 10 per cent. The privileges previously enjoyed by the Tashkent Metro were eliminated. Legal persons were exempt from compensation payments when the amount due was less than 5 times the minimum wage. In order to encourage the reutilization of waste in the extractive industry, there are no charges on waste that is further transformed or stored to be used as a raw material. In 2006, a further exemption was introduced in relation to the reuse of waste from phosphoric fertilizers.

Since the last EPR, reforms have moved towards tightening the regime of exemptions and privileges.

However, one exception, which was introduced by the 2006 reform, is the exemption from pollution charges for all organizations financed exclusively from the budget. If these public financed organizations include units that carry out economic activities (for example, commercial services), these activities are subject to pollution charges. The scope for favourable treatment for housing and communal services enterprises was reduced in 2006. Wastewater treatment plants of municipal companies now have to pay 20 per cent of base rates. Industrial companies, which treat wastewater from households, pay 50 per cent of base rates.

Another significant change was the introduction of a sliding scale of “frequency coefficients” in 2003. According to this new procedure, payments for emissions and discharges above specified limits increased by up to 5 times, depending on how much the limits were exceeded, with the highest coefficient being applied when emissions were 2.1 times above the limits. Previously, rates on emissions above specified limits were only 20 per cent of base rates. At the same time, emissions below specified limits benefited from lower payments, with the application of coefficients in a similar fashion. In 2006, a more stringent regime was introduced and all these coefficients were doubled. As a result, payments for pollution above the specified limits can now be increased by up to 10 times. The existing regime implies a high degree of progressivity. Given its symmetric character (with increases when emissions and discharges fall above limits, and reductions when they fall below), this system creates incentives for pollution reduction in a continuous way.

Collection procedures and revenue dynamics

The collection of payments for pollution charges has changed as a result of evolving rules regarding the allocation of the revenues raised. Following the introduction of payments for all emissions (within and above limits), 80 per cent of the revenues were allocated to the state budget, and the remaining ones to environmental funds. Environmental inspectors were responsible for collecting the revenues that accrued to environmental funds. Following the 2003 reform, local environmental funds received all payments, which were collected by inspectors. Since November 2004, all pollution charges accrue to local environmental funds, but these have to transfer 50 per cent of the revenues to the state budget. However, environmental inspectors are now tasked with collecting the full amount.

Table 5.3: Revenues from pollution charges, 2004–2008

	2004	2005	2006	2007	2008
Pollution charges, million sum	1,740.1	1,970.5	2,412.8	3,075.5	3,336.9
Pollution charges, US\$ million	1.71	1.77	1.98	2.43	2.53
As percentage of GDP	0.01	0.01	0.01	0.01	0.01
Memo					
GDP, billion sum	12,189.5	15,210.4	20,759.3	28,186.2	36,839.4
Exchange rate: sum per US\$	1,019.9	1,113.9	1,219.6	1,264.1	1,320.9
Breakdown by media, percentages					
Total	100	100	100	100	100
Within limits	54.80	55.45	60.51	56.98	54.43
Air					
Stationary source	14.00	14.99	17.09	17.37	21.97
Mobile source	7.02	3.45	4.06	2.73	2.66
Water	13.05	13.97	16.41	14.80	7.56
Land	4.57	4.17	5.06	4.58	5.19
Waste	15.57	18.87	17.88	17.51	17.06
Above limits	45.20	44.55	39.49	43.02	45.57
Air					
Stationary source	7.19	7.19	7.40	7.59	8.97
Mobile source	0.50	1.10	1.01	0.64	0.37
Water	6.67	5.86	5.09	7.28	5.78
Land	5.67	6.15	6.79	7.22	7.99
Waste	25.16	24.25	19.20	20.30	22.46
Penalties on arrears as percentage of total revenues	1.25	3.01	2.04	2.05	5.61

Source: State Committee for Nature Protection, 2009.

The responsibilities of environmental inspectors for payment collection involve an administrative burden that distracts them from their primary responsibilities. Their ability to enforce payments is weaker than that of the tax authorities, which has negative implications for compliance.

The 2003 reform also introduced monthly advance payments, which are based on the average monthly values of the previous quarter. This measure, which replaced quarterly liquidations, introduced more regularity in the revenues accruing from these payments.

Pollution charges are *ad quantum*, being charged per amount of pollutant emitted or waste discharged. There is no mechanism for the regular revision of rates which takes into account changes in the cost of implementing environmental measures. Rates were increased by 10 per cent in 2001, 30 per cent in 2003, and 20 per cent in 2006. A proposal for a further 30 per cent increase has been put forward, but not yet adopted. The existing procedure for the revision of rates is initiated by the Cabinet of Ministers following

the proposal of the SCNP, which must justify the request on the basis of the evolution of a number of indicators, such as changes in the minimum wage or in enterprises' costs of implementing environmental protection measures in the period since the last increase. The request of the SCNP is examined by the Ministry of Economy and the Ministry of Finance and subsequently endorsed by the Cabinet of Ministers by a decree.

The existing indexation mechanism includes a discretionary component that creates uncertainty regarding the timing and extent of the increases. This has negative implications for both the disciplinary effect of the charges and the real value of the revenue raised (as enterprises see how other costs increase, while the charges remain constant).

Pollution charges have increased in nominal terms in the period under review (table 5.3), boosted by higher rates and the toughening of the regime for emissions and discharges falling above specified limits. Revenues from pollution charges in 2008 were almost twice the amount raised in 2004. However, they have

steadily declined as a percentage of GDP, being down by around a third in this period.

Overall, the breakdown of pollution charges between revenues from emissions within and above specified limits has remained relatively stable in 2004–2008, although there are some differences depending on the media. The relative importance of waste discharged into water above specified limits has increased, but this is mainly the result of a sharp decline in emissions within the limits, resulting in a decline in the combined share in total revenues. These different dynamics suggest that economic instruments have various degrees of success in controlling pollution.

Waste disposal appears to be problematic: the ratio of payments for discharges above specified limits compared to payments for discharges within the limits is consistently high, accounting for 56 per cent of the total revenues from waste in the period 2004–2008. On average, revenues from payments for waste above specified limits represent 22 per cent of total revenues from pollution charges in this period. Overall, charges for waste disposal amounted to around 40 per cent of total revenues in 2008. By contrast, revenues from air pollution from mobile sources have been steadily declining, being only 3 per cent of the total in 2008, down from 7.5 per cent in 2004.

The transfer of responsibilities for collecting the full amount of charges to environmental inspectors seems to have been accompanied by a fall in collection rates. The amount of penalties for arrears as a percentage of total revenues doubled in 2005. Despite some improvements in later years, this ratio remained high and rose sharply in 2008 to 5.6 per cent.

Assessment

After the last reform, 171 pollutants when emitted into the air and 87 substances when discharged into water became liable for compensatory payments. This is a large number of pollutants and results in significant monitoring and administrative costs. There have been no significant attempts to streamline the system of pollution charges by introducing reforms that focus on a narrower set of pollutants and identify the level of emission charges required to create stronger incentives for changes in behaviour. Additionally, there have been no initiatives to link the reform of economic instruments to achieving specific environmental targets as part of policy packages that also combine elements of a regulatory nature. Past reforms have increased the cost of polluting

in a general way, but without any specific attempt to determine the appropriate level and structure of charges that would lead to more efficient instruments. Pollution charges remain more effective as a tool to raise revenues for environmental purposes rather than to create strong inducements for environmental investments.

In addition, the low technical quality and reliability of the environmental monitoring performed by enterprises regarding their own pollutants has been pointed out by the Asian Development Bank. A strong regulatory framework is needed as a condition for the effective application of economic incentives for pollution control.

Product charges could complement the role of emission charges in controlling pollution, being suitable for products that pollute when they are consumed, or it could be a good proxy for difficult-to-monitor emissions. With the exception of fuels, such economic instruments are not used at present. A project is under consideration to introduce product charges on low-quality coal, paint containing lead and ozone-depleting substances.

Other financial sources

Besides taxes and pollution charges, other sources can be mobilized to address environmental problems. In particular, the Clean Development Mechanism (CDM) represents a source of potential revenues. Efforts to develop renewable energy sources and increase energy efficiency would result in the reduction of greenhouse gas emissions, while providing a source of investment financing for these activities. Besides the CDM, the World Bank Carbon Partnership Facility creates opportunities to put in place carbon finance projects, particularly in the energy sector. Chapter 9 discusses carbon finance and other issues related to climate change.

5.3 Environmental impact of pricing and subsidies

Environmental management is an essential component of the economic and social development of the country. The most significant challenge in Uzbekistan is to create sustainable patterns of land and water use. Appropriate pricing can make a positive contribution to encourage efficiency and raise resources for necessary investments, so as to promote economic development while addressing environmental needs. To avoid waste and create

incentives for environmental investments, prices must reflect full costs. However, the use of resources is also directly influenced by regulations and the relative prevalence of non-payments and arrears, which affect the effective price paid by users.

Agriculture

The agricultural sector is the main water user, accounting for around 90 per cent of total consumption by volume. Low efficiency in terms of water use has contributed to widespread waterlogging and salinization. These environmental problems have clear economic implications, as they result in lower yields and the loss of agricultural land. The situation reflects a combination of weak economic incentives for water saving and a deteriorating infrastructure, as a consequence of low levels of investment. Deferred capital and operation and maintenance expenditures represent around 40 per cent of asset value.

National strategies have identified the lack of appropriate filtration protection (only around one third of canals have filtration cover) as a major reason for the excessive use of irrigation water. Around 60 per cent of the irrigated area depends on pumping, which represents a major cost, according to the World Bank. Pumped irrigation accounts for around 20 per cent of Uzbekistan's electricity consumption. Energy costs remain high due to the use of obsolete equipment.

The Interim Welfare Improvement Strategy acknowledged that irrigation could be used more efficiently and outlined plans for improved incentives for the use of land and water resources. These policy directions have been maintained in the Welfare Improvement Strategy.

Water for irrigation purposes is supplied free of charge (although a small fee for water use is included in the unified land tax), and there are no plans to adopt widespread pricing schemes. However, the Ministry of Economy has made proposals to significantly increase administrative penalties for the misuse of water. An effective application of both administrative and economic water management instruments would require an improvement in measuring devices. Along these lines, the Welfare Improvement Strategy envisages the development of systems for measuring water use in irrigation.

The agricultural sector has undergone a significant reorganization, with the division of the large collective shirkat farms into smaller plots leased to individual

farmers. Water-user associations have emerged, albeit on a limited basis, with some competencies on local irrigation management, including contributions to the financing of infrastructure. However, land tenure arrangements do not yet envisage full ownership, which rests ultimately with the State, which weakens financial incentives.

Energy

Despite some improvement in recent years, overall energy efficiency is low, which contributes to air pollution. Gross domestic product (GDP), on a purchasing power parity basis, per kilogram of oil equivalent, was only US\$ 1.11 in 2005, against US\$ 3.99 for middle- and low-income countries, according to the World Bank World Development Indicators. Increased efficiency would help industry to meet environmental standards. Low energy prices had discouraged investment and were not conducive to higher efficiency. In particular, oil and coal were sold at prices below world market prices. However, there have been significant increases in electricity and gas tariffs. Thus, between April 2002 and the end of 2004, electricity prices rose 2.6 times, thus improving the financial performance of the electricity sector. Electricity tariffs doubled between 2004 and the first quarter of 2009. Current tariffs now cover both operational and maintenance costs. They vary according to the type of user. Households pay around 31 sum/KWh, around half the amount charged to industrial users. Tariffs for publicity displays are 3 times higher.

Electricity tariffs do not include an investment component to finance the expansion and upgrading of existing infrastructure. The reduction in losses in gas transmission and electricity distribution – a problem identified by the Welfare Improvement Strategy – requires additional investments.

Non-payments in the energy sector had been widespread and the Government addressed the situation through a metering programme, which has been accompanied by a significant improvement in collection rates. According to a report prepared by the Energy Charter, this metering programme has already been largely completed in the electricity and gas sector. Starting in 2002, gas meters have been installed in households that were connected to the gas distribution network. The 2008 Anti-recessionary Programme envisages the gradual introduction of a system of automatic control over the consumption of electricity and payments for all types of users

in the period 2009–2015, being finalized for large enterprises in 2009. In the period 2009–2012, the collection of payments for electricity and communal services will be transferred to private operators, which will be paid on the basis of their success.

Transport

The increased use of vehicles is a main source of pollution in urban areas. The proliferation of mini-vans for public transport has contributed further to traffic increases. The tax on fuel for transport by physical persons, as considered in section 5.2, replaced a vehicle tax with revenues, which, unlike the current tax, did not change with usage.

According to the GTZ International Fuel Prices, Uzbekistan is considered as a country with very high gasoline taxation, resulting in a retail price of US\$ 135 cents per litre. By contrast, the retail price of diesel is low, on an international comparison, being equal to US\$ 75 cents per litre – as of mid-November 2008. While efforts have been made to eliminate leaded fuel, some marginal use remains.

The excise tax rate on petrol was 40 per cent in 2009 (or no less than 281,000–221,000 sum per ton), while diesel was taxed at 34 per cent (or no less than 38,000 sum per ton). Petrol was taxed at rates ranging from 281,000 to 221,000 sum per ton in 2009, with diesel taxed at 130,000 sum. Kerosene is taxed at only 9 per cent.

Excises on imported vehicles discriminate against old models, thus creating an incentive for the renewal of the fleet. Typically, the bias against used vehicles is equivalent to US\$ 3 per cubic centimetre of engine displacement. In any case, rates for both new and used vehicles are rather high to protect domestic production (up to 70 per cent in some cases). Customs tariffs on imported vehicles are also levied, with used vehicles being charged an extra US\$ 1.2 per cubic centimetre of engine displacement. The Road Fund collects revenues from the entry and transit of vehicles from other countries and purchases by nationals, but these receipts are not used for environmental purposes.

Communal services

Access to safe water and sanitation remains limited in rural areas and small towns. Wastewater treatment is generally available in cities, but does not reach village settlements. According to the Asian Development

Bank, less than 40 per cent of the population enjoy wastewater treatment facilities. In particular, around one fifth of the rural population does not have access to safe drinking water. Overall, the water supply and sanitation supply is in poor state, due to neglected or insufficient infrastructure. This results in high costs and large unaccounted amounts of water.

Municipalities are responsible for municipal waste collection and disposal, while municipal water enterprises raise wastewater treatment charges on households and enterprises. Problems of cost recovery and non-payments hamper the involvement of the private sector. However, tariffs have become more cost-reflective, although there are significant differences across regions. Shortfalls are routinely covered by local budgets. Although the financial position of municipal providers has improved, raising sufficient resources to modernize infrastructure remains a challenge. The sector has benefited from international support (section 5.8). Government policies envisage increased participation of the private sector in the provision of these services through public–private partnerships. There is already some experience with private–public partnerships on water management in Bukhara and Samarkand, but the results have been mixed. Overall, the incentives for water conservation have not been strong enough due to tariff levels and limited coverage of metering. As much of the major funding required will be provided on a non-grant basis (loans or equity), further progress towards cost recovery is required. The current tariff system does not have strong enforcement mechanisms or provide incentives through tariff plans for regular payers. Higher tariffs need to be accompanied by improvements in the services provided to users.

The management of industrial and municipal waste is one of the major environmental challenges being faced by Uzbekistan. In 2007, the Senate Committee on Agrarian Issues, Water Management and the Environment approved a draft national waste management strategy and action plan for 2008–2017 (chapter 1). Waste removal fees are low and do not provide the resources required to upgrade the vehicle fleet used for collection, which is very old. While the system of pollution charges raises some revenues from enterprises for the disposal of industrial waste, this does not apply to household waste. Enforcement mechanisms are lax, which creates weak incentives for compliance and limits the scope for the use of economic instruments for waste management. Statistical reporting on waste is limited, which

Table 5.4: Environmental funds, revenues and expenditures in million sum, 2001–2007

	2001	2002	2003	2004	2005	2006	2007
Total revenues	256.9	407.6	782.0	2,019.3	1,208.7	1,448.1	1,978.7
Local (excl. transfers)	192.8	304.1	593.6	1,582.3	906.7	1,090.8	1,549.4
National	64.0	103.6	188.4	437.0	302.0	357.3	429.3
Total expenditures	239.8	387.2	644.6	1,693.1	1,395.3	1,622.8	1,955.0
Local (excl. transfers)	176.2	294.5	514.0	1,424.2	884.0	1,234.5	1,577.5
National	63.6	92.7	130.6	268.9	511.3	388.3	377.4

Source: State Committee for Nature Protection, 2009.

hampers the implementation of effective strategies. Also lacking is a system of product charges, which would encourage recycling or could be used to raise funding for waste disposal enterprises.

5.4 Environmental funds

Earmarked funding can play an important role in channelling financing towards environmental purposes and shielding environmental policies from competing claims on resources. The Law on Nature Protection establishes the basis for the creation of funds for environmental protection at the state and local levels.

The system of environmental funds includes the National Fund for Nature Protection and 14 local funds. Tashkent City and the Tashkent region accounted for around 40 per cent of total revenues in 2008. At the various levels, the funds are managed by a council, which includes representatives from the relevant territorial level of the SCNP, ministries and scientific institutions.

The 1993 Cabinet of Ministers Resolution on the Statute on Nature Protection Funds defines the basic rules governing the organization of the funds, the source of revenues and the types of allowed expenditures. In the period since the last EPR, amendments were introduced in 2003 and 2004

concerning the share of different revenue types that accrue to the system of environmental funds (section 5.1). According to the latest reform (2004 Cabinet of Ministers Resolution on Measures to Streamline Deductions to the Off-budget Funds of Ministries and Agencies) and the 2004 Law on Strengthening Control over the Rational Use of Biological Resources, including their Import and Export across Uzbek Borders, the local funds retain 50 per cent of pollution charges, compensation for environmental damage and fines for violations of environmental legislation (excluding those concerning flora and fauna and hunting-related offences) and fines resulting from the activity of environmental inspectors. In addition, local funds' revenues also include returns on the participation in the stocks of enterprises that carry out environmental measures and voluntary contributions. Pollution charges account for the bulk of revenues (around 80 per cent in 2008), followed by fines.

Revenues accruing to the National Fund for Nature Protection include 25 per cent of the revenues of the system of local funds, income from participation in enterprises, voluntary contributions and publishing activities. In addition, according to the 2004 reform, it receives 50 per cent of the fines and claims for environmental damage which result from the activity of central environmental inspectors. In practice, transfers from local funds account for almost all

Table 5.5: Percentage of expenditures of the National Fund for Nature Protection, 2001–2007

	2001	2002	2003	2004	2005	2006	2007
Expenditures	100	100	100	100	100	100	100
Environmental measures	38.3	38.2	59.4	75.2	67.2	64.5	55.6
Training	3.2	1.1	2.7	1.0	0.6	1.6	1.4
Publications	4.7	10.0	4.9	4.5	0.4	0.2	3.7
Bonuses	10.4	11.0	14.3	11.2	5.8	12.7	15.9
Others	43.4	39.7	18.7	8.2	26.0	21.0	23.5

Source: State Committee for Nature Protection, 2009

Table 5.6: Percentage of expenditures of local environmental funds, 2004–2008

	2004	2005	2006	2007	2008
Expenditures (excluding transfers)	100	100	100	100	100
Construction, technical equipment, reconstruction and repair of environmental infrastructure	12.2	6.8	9.3	4.8	3.2
Research and feasibility studies	1.6	1.6	3.7	1.5	7.5
Territorial works	1.2	2.9	3.3	3.6	0.0
Co-financing	20.0	24.2	23.9	24.9	29.7
Development material and technical basis	29.7	30.2	29.0	25.4	22.0
Training	0.5	1.2	0.5	0.8	0.6
Bonuses and premiums	17.6	18.3	17.1	17.5	19.8
Others	17.3	14.9	13.3	21.5	17.2

Source: State Committee for Nature Protection, 2009.

revenues of the National Fund for Nature Protection (table 5.4).

Environmental spending carried out by the funds includes that on infrastructure equipment, rehabilitation work following environmental damage and the development of protected natural areas, among others. In addition, the activities financed by the funds also include scientific and research work and material and technical support for the activities of the environmental authorities. The funds' resources are also used to pay bonuses to staff and other collaborators (with a limit of 15 per cent of revenues) and compulsory insurance for environmental inspectors. The funds can also take stakes in the capital of enterprises and contribute to the repayment of credits granted to them. The National Fund for Nature Protection also engages in international cooperation activities (tables 5.5 and 5.6).

Spending is carried out according to annual programmes endorsed by the Cabinet of Ministers, at the national level, and by the relevant executive authority at lower territorial levels. Unspent resources are carried over to be spent the following year. The funds invest temporary financial surpluses in the form of banking deposits, but have refrained from borrowing. As mentioned in section 5.2, the introduction of monthly advance payments has facilitated financial planning.

Every year, the National Fund for Nature Protection publishes requests for financing proposals in the media and through circulation among other government departments. A first selection is carried out by the Scientific and Technological Council and the SCNP management, which may request external advice, if necessary. The projects selected are then

considered by the Council of the National Fund for Nature Protection, which, on the basis of forecast revenues, determines which projects can potentially be financed. Based on these estimates, additional sources of financing are sought, in particular through collaboration with local funds. A final programme with all the feasible projects is prepared for consideration by the Cabinet of Ministers, which ensures that proposals are in line with the nationally approved programme of environmental actions.

Project performance is monitored through weekly reports that are compiled into a quarterly report for consideration by the Ministry of Finance and the Cabinet of Ministers. Local fund activity, which is supervised by the National Fund for Nature Protection, is also included in these reports. Control over local funds includes ensuring that the amount of expenditures devoted to practical environmental protection measures is not less than 40 per cent of the total.

Resources accruing to the system of environmental funds are closely linked with the dynamics of pollution charges. Since these revenues have increased as a result of the various reforms described in section 5.2, the funds have accumulated the means to increase spending. Environmental funds have played an important role in financing planned environmental actions. From 1999 to 2005, the National Fund for Nature Protection was expected to provide only around 4 to 6 per cent of the total resources required. In practice, given the shortfalls from other sources, the actual share came to around 12 to 14 per cent. From 2008 to 2012, the amount envisaged is around 14 to 16 per cent. The increased allocation reflects the improved financial situation of the National Fund for Nature Protection.

The improved financial situation of the system of environmental funds has allowed them to play an increased role in the financing of environmental expenditure. The National Fund for Nature Protection is able to exert close control over the performance of local funds. However, the institutional structure and programmatic framework under which the funds operate could be improved, in line with the Organisation for Economic Co-operation and Development (OECD) *St Petersburg Guidelines for Environmental Funds in the Transition to a Market Economy and Good Practices for Public Environmental Expenditure Management in Transition Economies*. There are no well-defined and publicized criteria regarding the adoption of decisions in the councils that govern the funds, in particular in connection with the selection of the projects to be financed. The opportunities for other stakeholders to influence the decision process are not clearly established. Potential applicants do not have access to the criteria used to determine project eligibility, and the connection with environmental priorities is not always explicitly established.

5.5 Main trends in environmental spending

Environmental expenditures include outlays by government agencies, the domestic business sector, foreign companies and donor organizations. The State Committee on Statistics (Goskomstat) routinely collects information on expenditures, although its dissemination is limited. The existing reporting system provides information on both the abater principle basis: in relation to the unit that carries out the expenditure and the financing principle, namely who pays for it. However, according to the OECD, this does not fully follow the Classification of Environmental Protection Activities and Expenditure. Since 2006, information has also been collected on small enterprises (with less than 100 workers). No information is available on environmental spending by households.

Overall environmental expenditure remains low in both absolute and relative terms. However, it has registered rapid growth in recent years (table 5.7). In 2007, overall environmental expenditure was

Table 5.7: Environmental spending, 2001–2008

	2001	2002	2003	2004	2005	2006	2007	2008
Total, million sum	28,147.3	33,491.5	155,294.3	101,435.9	112,594.8	200,613.3	239,373.8	..
Total, US\$ million	66.5	43.4	159.9	99.5	101.1	164.5	189.4	..
Current, million sum	16,612.4	24,117.0	146,536.5	86,560.0	100,375.2	131,967.8	186,767.5	..
Capital, million sum	11,534.9	9,374.5	8,757.8	14,875.9	12,219.6	68,645.5	52,606.3	96,710.3
As percentage of GDP								
Total	0.57	0.45	1.61	0.83	0.74	0.97	0.85	..
Current	0.34	0.32	1.52	0.71	0.66	0.64	0.66	..
Capital	0.23	0.13	0.09	0.12	0.08	0.33	0.19	0.26
Composition								
Total	100	100	100	100	100	100	100	..
Water	39.47	47.07	84.62	59.84	40.03	30.63	37.23	..
Air	24.75	27.30	7.00	25.60	44.47	55.56	47.35	..
Land	35.20	24.02	7.10	10.80	12.53	12.43	12.89	..
Biodiversity	0.56	0.87	1.21	3.73	2.07	1.07	1.61	..
Current	100	100	100	100	100	100	100	..
Water	50.13	52.79	88.08	64.27	42.48	43.70	46.07	..
Air	37.37	32.89	6.39	22.60	44.94	38.20	39.08	..
Land	12.24	14.06	4.46	11.19	10.28	16.46	13.06	..
Biodiversity	0.26	0.26	1.07	1.94	2.30	1.63	1.79	..
Capital								
Total	100	100	100	100	100	100	100	100
Water	24.11	32.34	26.75	34.08	19.94	5.51	5.87	5.91
Air	6.57	12.92	17.12	43.05	40.64	88.92	76.71	76.42
Land	58.03	15.04	13.32	8.52	10.98	2.12	1.10	0.96
Mineral resources	10.24	34.62	37.92	0.00	20.03	2.56	12.89	16.17
Others	1.05	5.07	4.90	14.35	8.41	0.89	3.43	0.54

Source: State Committee for Nature Protection, 2009.



Business Centre in Tashkent

US\$ 189 million, almost 3 times the level observed in 2001. The sharp increase observed in 2003 was mainly due to emergency interventions to repair local wastewater treatment plants for municipal and industrial discharges. Following this one-off occurrence, environmental spending averaged 0.85 per cent of GDP in the period 2004–2007. In recent years, spending on air protection has emerged as the largest spending category, accounting for almost half of total expenditures in 2005–2007. This predominance has been driven by the increased importance of this medium in total environmental investments, with air accounting for more than 80 per cent of the total in 2006–2008. This sharply contrasts with the declining relative importance of investments in water protection, which accounted for only 5.8 per cent of the total in 2006–2008, against an average 27.4 per cent in 2001–2005. Investment in land protection has steadily declined.

There is no clear trend in the share of environmental investment, which reached 22 per cent in 2007, over total expenditure. This is in line with the average for the period 2001–2007, but significant annual variations have been observed, as the “lumpiness” of investment gives some degree of volatility to the overall series. In 2008, environmental investments represented 1.1 per cent of total investments in the economy. This is below the figures observed in more advanced European countries, but is relatively high

in the regional context, with Kazakhstan registering 0.3 per cent in 2002–2005.

5.6 Public spending

According to the OECD, environmental protection expenditure from public sources accounted for around 30 per cent of the total in the period 2000–2005. This estimate implies a significant contribution by enterprises to environmental protection, which is in line with the information provided by the SCNP stating that enterprises accounted for 69 to 84 per cent of environmental spending in the period 1994–2007.

Environmental spending is carried out by a number of government agencies, in addition to the SCNP. Budget reports, as published on the Ministry of Finance website, do not identify environmental protection as a separate spending item, as there is not a fully developed classification of expenditures according to the functions of the Government. There are details on current spending by the SCNP (mostly wages), equivalent to 891.5 million and 1,159 million sum in 2004 and 2005, respectively. The latter represented 0.03 per cent of total budget expenditures (excluding off-budget spending) in 2005. Capital spending is not carried out from this budgetary allocation. The SCNP controls the system of environmental funds, which was discussed in section 5.4. From 2002 to 2007, environmental measures financed by these funds

Table 5.8: Foreign aid, general environment protection in US\$ million, 2000–2007

	2000	2001	2002	2003	2004	2005	2006	2007
Committed								
Total	0.13	1.00	33.59	5.24	0.60	3.15	0.41	0.57
DAC* countries	0.13	1.00	33.59	5.24	0.03	2.93	0.23	0.19
Multilateral	..	..	..	..	0.57	0.22	0.18	0.38
Executed								
Total	..	..	2.62	10.52	16.18	2.30	4.56	1.35
DAC* countries	..	..	2.62	10.52	15.61	2.06	4.29	0.97
Multilateral	..	..	..	..	0.57	0.25	0.27	0.38

Source: OECD. Stat Extracts, web-based (accessed in 2009).

Note: *Development Assistance Committee.

were equivalent to an average of 2.7 per cent of total environmental capital spending.

The introduction of the treasury system has improved transparency and accountability in the budgetary process in general. However, environmental funds remain outside this system. A medium-term budget framework has been developed since 2005, providing an overall envelope for financial planning. However, the visibility of environmental priorities in this planning process is limited. The Welfare Improvement Strategy identifies the development of results-based budgeting and the use of performance-based indicators to determine the efficiency of spending as priorities. These efforts have so far focused on the largest spending categories, such as health and education. The mainstreaming of environmental policies, namely their integration into economic and sectoral policies, would benefit from improved expenditure reporting, in order to assess the efficiency of spending in view of the objectives pursued and the existing trade-offs between targets.

The SCNP is responsible for the formulation, organization and implementation of the measures envisaged in the Programme of Actions on Nature Protection 2008–2012. The Programme identifies sources of financing for the various actions proposed. However, the process of concordance with other ministries and agencies is limited. This hampers the ability to define commonly accepted environmental challenges and to commit the financing required to address them. The Programme builds to a large extent on a number of actions planned by large enterprises which cover around 90 per cent of the cost of the Programme. The National Fund for Nature Protection is identified as a reliable source of financing (section 5.4).

While this is a multi-year programme, budgetary allocations for financing are provided only on an annual basis. This also concerns the resources provided by the State Investment Programme, which is prepared by the Ministry of Economy every year. The Programme of Actions on Nature Protection 2008–2012 includes actions on radiation clean-up to be financed by the State Investment Programme, yet these are not fully estimated.

The Welfare Improvement Strategy envisages a number of reforms that would have a positive effect on the amount and quality of environmental spending. Among the long-term objectives regarding the management of government expenditures, specific reference is made to the provision of adequate financing for strategic development programmes and projects on water supply, sanitation and the environment. These priorities are in line with the targets associated with the Millennium Development Goal of ensuring environmental sustainability, including increasing access to clean potable water and safe sanitation.

5.7 Domestic enterprise spending

Enterprises carry out the bulk of environmental spending in the country, as mentioned previously. They can benefit from tax breaks when introducing environmentally friendly technologies. Environmental authorities play a certification role, in order to ensure that the purchase of equipment fulfils the necessary requirements.

The SCNP discusses with large enterprises their future action plans so that they comply with environmental legislation. The agreements reached on the measures to be adopted are incorporated in the Programme

of Actions on Nature Protection for 2008–2012. According to the rules governing environmental funds, enterprises' environmental expenditures can be offset against payments due for pollution charges.

The market for environmental services remains little developed, as the overall level of environmental expenditures and the regulatory framework create limited business opportunities.

5.8 Foreign direct investment and donor spending

Overall foreign direct investment (FDI) in Uzbekistan has been rather low. According to European Bank for Reconstruction and Development figures, cumulative FDI per capita in the period 1989–2007 was only US\$ 77, which is the lowest among the transition countries. However, FDI inflows have accelerated substantially in recent years. Investments in 2007–2008 are estimated to be 30 per cent higher than all the cumulative inflows in 1995–2006. Some of the sectors to which foreign investors have been attracted, such as the energy sector, have significant environmental implications.

Foreign donors have been involved in a large number of projects with direct and indirect environmental impact. The OECD calculates that Uzbekistan accounts for 7 per cent of donor and international financial institution environmental assistance in 2001–2005, or almost 0.4 per cent of Uzbekistan's GDP over this period. According to OECD. Stat Extracts, bilateral and multilateral donor financing for general environment protection totalled US\$ 44.7 million in 2000–2007, on a commitment basis (table 5.8). A large part of this overall amount is explained by significant donations made in 2002 by Switzerland for the Bukhara and Samarkand water supply (US\$ 10.1 million) and a United States Environmental Management Programme worth US\$ 18 million. On a disbursement basis, over the same period, the amounts involved totalled US\$ 37.5 million. Water supply and sanitation grants disbursed over this period reached US\$ 27.1 million.

International organizations have provided funding and technical assistance for various projects with an environmental impact. At the end of 2008, the Asian Development Bank approved its largest project to date in the country, concerning water resources management, involving a US\$ 100 million loan and a US\$ 1.2 million technical assistance grant. Water management and water supply have been

an important focus of World Bank activities in the country, including projects on drainage, irrigation and wetlands development, and urban water services in Bukhara and Samarkand. A total of 11 national Global Environment Facility projects have been approved so far, with a combined grant value of US\$ 11.2 million, more than one third of which corresponds to a programme for phasing out the use of ozone-depleting substances.

The development of the first comprehensive national poverty reduction strategy (the Welfare Improvement Strategy) has provided a better foundation for coordinating efforts with donors along national priorities.

5.9 Conclusions and recommendations

Some progress has taken place in a number of areas in the period since the first EPR was carried out. The pollution charges regime has been tightened and the resources available to the system of environmental funds have increased. There has been a shift towards "green taxation", increasing the rates of taxes on natural resources while reducing profit tax rates. Tariffs have become more cost-reflective and the non-payments situation has improved. Environmental management, in particular spending on water supply and sanitation, is recognized as a priority in the Welfare Improvement Strategy. The framework for environmental spending has improved, against the background of general progress in budgetary reforms in the country.

The system of pollution charges plays an important role in financing public environmental spending and creates incentives for a reduction in emissions and waste. This dual role (revenue-raising and behaviour-changing) depends on strict payment compliance and the regular revision of rates as prices increase. The current framework does not guarantee these conditions. Indexation is carried out only on an ad hoc basis. Entrusting environmental inspectors with the task of collecting payments distracts them from their core activities, introduces administrative costs and weakens enforcement. Tax authorities are in a stronger position to ensure timely payments as part of their routine tax collection duties.

Recommendation 5.1:

The State Committee for Nature Protection, the Ministry of Finance and the Ministry of Economy should:

- (a) *Define a mechanism to review the rates of*

payments for environmental pollution;

(b) Simplify the system of pollution charges, focusing on a reduced number of pollutants and determining rates to create stronger incentives for changes in behaviour.

The effectiveness of the system of pollution charges, concerning both revenue-raising and the creation of incentives for changes in behaviour, is undermined by the existence of exemptions for budget-financed organizations and communal services enterprises. From an environmental point of view, it is important for regulations to be applied in a uniform way, so that the “polluter pays” principle is clearly observed and distortions are not created because of poor incentives. If the financial burden for some organizations is considered too large, direct compensatory financing from the budget could be provided.

Recommendation 5.2:

The State Committee for Nature Protection, together with the Ministry of Finance and the Ministry of Economy, should quantify the privileges and exemptions given to budgetary organizations and enterprises and assess their effectiveness, in order to facilitate decision-making.

The system of environmental funds has proven its role as a reliable source of funding for environmental purposes. However, an increased emphasis on transparency, methodological work and improved policy analysis would improve its effectiveness. This would have a positive effect on attracting additional resources, both from the donor community and general budget financing.

Recommendation 5.3:

The State Committee for Nature Protection and the Cabinet of Ministers should increase the transparency and effectiveness of the activities of the governing councils of environmental funds by:

(a) Improving decision-making rules for the adoption of decisions in the governing councils;

(b) Improving the methodology for selecting projects for funding and evaluating their effectiveness and making this information publicly available;

(c) Publishing annual reports on the activities of funds which provide details on financial performance and show the impact on the achievement of policy targets.

Although product charges are easy to administer, they are not widely used. They would be a useful addition to the range of economic instruments available and could contribute to the simplification of the system of pollution charges, which remains overtly complicated and has significant monitoring costs.

Recommendation 5.4:

The Cabinet of Ministers, in cooperation with the State Committee for Nature Protection, should:

(a) Consider the possibility of replacing some pollution charges with product charges;

(b) Draft by-laws that increase the cost of environmentally damaging products through taxes and allocate the revenues raised for environmental purposes.

***PART III: INTEGRATION OF ENVIRONMENTAL
CONCERNS INTO ECONOMIC SECTORS AND
PROMOTION OF SUSTAINABLE DEVELOPMENT***

Chapter 6

SUSTAINABLE MANAGEMENT AND PROTECTION OF WATER RESOURCES

6.1 Introduction

Uzbekistan and the majority of its neighbouring countries are situated in the Aral Sea internal drainage basin, where they share transboundary waters. The scarcity of freshwater is currently, and will be in the future, the greatest environmental problem, since water is the key resource for irrigating low productivity saline lands for agricultural production. In-stream disposal of collector–drainage waters and inefficient wastewater purification systems result in a deterioration of water resources quality and an increase in water salinity.

With respect to the availability of water resources, Uzbekistan is located in quite unfavourable natural conditions. The hydrographical network of Central Asia has a very uneven distribution of water bodies and resources. Since only about 10 per cent of the water resources are generated in the country, Uzbekistan is highly dependent on the inflow of waters from its neighbouring countries. The utilization of water resources without taking into account the environmental capacity has also resulted in water quality deterioration and a tense situation concerning drinking water supply.

Coinciding with the second Environmental Performance Review (EPR) of Uzbekistan, the theme of the United Nations World Water Day 2009 was “Shared Water – Shared Opportunities”, with particular emphasis on transboundary waters, which is drawing attention to one of the most alarming water crises not only in central Asia, but in the world – the Aral Sea catastrophe, partly caused by the water management in the Aral Sea basin of recent decades.

The reasons for and consequences of the Aral Sea catastrophe are well known. The drying-up of the Aral Sea has been accompanied by a wide range of other environmental, economic and social problems in the basin, which led to a variety of diseases emerging or becoming increasingly common among the inhabitants, the degradation of valuable farmland,

traffic routes and residential areas, unemployment, impoverishment and migration.

6.2 Water resources

The distribution of water resources in the Aral Sea internal drainage basin is extremely uneven and determined by different surface flow generation conditions that are favourable in the mountainous areas and unfavourable in vast plain areas occupied by deserts and semi-deserts.

The largest amount of surface water resources (about 90 per cent) is generated in the mountainous areas of neighbouring countries. Internal water resources comprise lakes, groundwater resources, rivers and the water reserves of glaciers. Large and small rivers, as well as groundwater, are the main constituents of available water resources in Uzbekistan (table 6.1).

The main rivers are the Amu Darya River, formed by the confluence of the Vakhsh and Pyandj Rivers, the Syr Darya River, formed by the confluence of the Narin and Karadarya rivers, and the Chirchik River near Tashkent. The Amu Darya River basin includes the Surkhandarya, Sherabad, Kashkadarya and Zarafshan rivers, but only the Kashkadarya and Sherabad Rivers are entirely located within the territory of Uzbekistan. In addition to the main rivers, there are over 17.7 thousand natural water streams in Uzbekistan. The Amu Darya River delta, with an area of 700,000 ha, is a natural wetland system and has been significantly changed by the Aral Sea crisis.

Surface water

The Aral Sea and its littoral zone is served by an annual inflow from transboundary watercourses within the approved water intake limits of not less than 14.5 km³/year. This represents 10 km³/year for the Amu Darya River and 4.5 km³/year for the Syr Darya River. Compliance with these limits depends on water availability in a given year as well as the ability to implement measures aimed at the rational

Table 6.1: Breakdown of currently available water resources, million m³

River basin	River			Groundwater	Recommended for collector-drainage use	Available water resources
	Stem stream	Small	Total			
Syr Darya	10,490	9,425	19,915	1,590	2,600	24,105
Amu Darya	22,080	10,413	32,493	301	2,310	35,104
Total for Uzbekistan	32,570	19,838	52,408	1,891	4,910	59,209

Source: State Committee for Nature Protection, 2008.

use of water by users. To protect the delta and coastal ecosystems from the threat of damage, Uzbekistan envisaged the creation of artificially regulated ponds to replace the former littoral and intra-delta lakes and sea bays, along with a set of forest amelioration measures. For this purpose, it is planned that up to 3.0 km³ of the country's available water in an average year will be released from the Amu Darya River downstream of the Kzyldjar site. The amount of released water varies between 0.5 and 4 km³/year (2005) due to water availability.

There are approximately 500 lakes in Uzbekistan. They are mainly small water bodies with an area of less than 1 km². Only 32 lakes have a surface exceeding 10 km². Winter discharges of water from the Toktogul Reservoir resulted in increasing the area of the Aydar Arnasay Lakes System, which is now the largest in Uzbekistan. With its area of 3,600 km² and its storage capacity of 42 km³, this lake exceeds the water reserves of all other reservoirs. In 2008, it was added to the list of the Ramsar Convention on Wetlands of International Importance Especially as Waterfowl Habitat.

Reservoirs play a very important role in the operation of water management systems in Uzbekistan, adding to the capacity to cope with variability (hydrological extremes) and to control water resources. Currently, there are 51 operating reservoirs in the country, which are mainly used for irrigation purposes. Uzbekistan's largest reservoirs have multipurpose uses and are intended mainly for irrigation, power engineering and industrial needs. The total rated storage capacity of these reservoirs is 18.8 km³, and the active storage capacity is 14.8 km³. These man-made wetland ecosystems are used for fishing. The ecological problems of wetlands are caused by the unstable regime of water inflow and the fact that they are poorly protected. As a result, there are only limited possibilities to conserve the habitat and biodiversity of this ecosystem.

Groundwater

The estimated regional groundwater reserves in Uzbekistan make up 18,455 million m³/year. The total actual extraction is 7,749 million m³/year, which is about 42 per cent of the estimated reserves (table 6.2).

The total volume of natural groundwater in Uzbekistan is estimated to be 24.35 km³. Out of this amount, 20.79 km³ lies in the Quaternary deposit, 2.92 km³ in the Upper Pliocene–Quaternary deposit, and 0.46 km³ in the Upper Cretaceous deposit. Fresh groundwater is concentrated mainly in the Fergana Valley (34.5 per cent) and the regions of Tashkent (25.7 per cent), Samarkand (18 per cent), Surkhandarya (9 per cent) and Kashkadarya (5.5 per cent), with the rest being brackish or saline and having limited potential for use. For the remaining areas, the freshwater total is about 7 per cent.

Currently, the groundwater resources of Uzbekistan can provide about 64 million m³/day. The balance between groundwater extraction and formation in the centralized extraction areas is observed by monitoring wells. The trend in groundwater abstraction has increased from 13.45 million m³/day in 2001 to 18.19 million m³/day in 2008, with 120 cities and district centres covered. Owing to reorganization and new automatic devices, the number of observation stations was reduced by 40 per cent (from 1,850 to 1,074) in 2001.

The regional assessment also covers transboundary aquifers from the Central Asian countries. Although the studies have not been completed, 19 aquifers with significant resources have been reported as transboundary, bordering or shared by two or more countries. Twelve of them are shared by Uzbekistan and its neighbours. Transboundary groundwater plays a significant role in the region.

Table 6.2: Groundwater reserves and use, million m³/year

Estimated regional groundwater reserves	18,455
Reserves confirmed for extraction	7,796
Total actual extraction	7,749
Domestic water supply	3,369
Industry	715
Irrigation	2,156
Vertical drainage wells	1,349
Pumping tests	120
Other	40

Source: CAWATERinfo, http://www.cawater-info.net/ara/groundwater_e.htm (accessed in August 2009)

Since 2001, the observation of these 12 transboundary aquifers has become increasingly of interest. The impact of industry on the transboundary groundwater resources in Uzbekistan, Kyrgyzstan and Tajikistan is observed by 12 observation stations.

6.3 Water quality and monitoring

Considering the close relationship between environmental conditions and water availability, many national indicators have been developed for the assessment of water quality. Twenty-five ecological indicators and ten subindicators are used to assess the changes in the state of water resources, water consumption volumes in different economic branches, streamflow deficit rate and quality change patterns of surface water and groundwater.

Surface water quality

The pollution of surface water bodies is widespread and results in the considerable pollution of groundwater, including the water in wells. Water pollution plays a determining role in the increase in morbidity rate (kidney disease, oncological and acute infectious diseases), resulting in increased adult and child mortality rates. Anthropogenic impacts also result in soil pollution (salinity, toxic pollution, pesticides, residual quantities of fertilizers and heavy metal pollution) and affects public health.

The current quality of the country's water resources remains extremely unsatisfactory. The highest level of mineralization and pollution is observed in the middle and lower reaches of the main rivers. This presents a serious threat to the life and health of the population and to the conservation of habitats. Polluted water comes from irrigated agriculture (78

per cent), industry (18 per cent) and the municipal sector (4 per cent). Agriculture is the main polluter of surface water and groundwater. Although industrial effluents are slightly smaller in volume, they are more dangerous and harmful because of their level of toxicity.

The water pollution index (WPI) is used for the integrated assessment of water quality. The WPI calculates the arithmetic mean value of six hydrochemical indices expressed as fractions of the maximum allowable concentration (MAC). These indices are the content of dissolved oxygen, biochemical oxygen demand (BOD) and any other four pollutants with the highest above average concentrations. There are seven classes of water quality according to the WPI, from I (very clean, WPI < 0.3) to VII (extremely dirty, WPI > 10).

Overuse of agrochemicals (nitrates, phosphates, pesticides) results in the intensive pollution of agricultural lands and water resources, from the irrigated fields into collector–drainage waters. Their concentration in collector water exceeds the MAC values for domestic/drinking water supplies by 5 to 10 times.

The analysis of available information indicates that the WPI for almost all water for the last three years has changed little and is consistent with the water quality class III (moderately polluted). A small number of water bodies corresponded to the Class II water category (clean). These include the Chatkal, Ugam, Aktashsay, Kyzylcha and Chimgansay Rivers in different years ranging from Class II (clean) to Class III (moderately polluted) due to heavy anthropogenic pressures in the Chimgan tract.

Groundwater quality

In the east of Uzbekistan, 60 per cent of the total water reserves are underground. In all but a few areas, this water meets the Uzbek 2000 state standard (O'z DST) 950 on drinking water.

Groundwater reserves in the western part of the country (in the lower reaches of the Zarafshan River and the western part of the Kashkadarya, Syr Darya, Amu Darya and Central Kyzyl Kum basins) are highly mineralized and hard. The fresh groundwater lenses formed along the large watercourses (Amu Darya River and irrigation canals) and used to supply drinking water to the Khorezm region and the Republic of Karakalpakstan do not meet national

Table 6.3: Water resources use average, 2002–2006

Water resources use	km³	%
Total, including:	55.1	100
Irrigated farming	49.7	90.2
Non-irrigation users, including:	5.4	9.8
Domestic and drinking water supply	3.4	6.1
Industry	1.2	2.2
Fishing sector	0.8	1.5

Source: State Committee for Nature Protection, 2008.

standards due to an increase in the last 10 to 15 years in mineralization and hardness (the effects of irrigation).

Around 50 per cent of the total volume of groundwater extraction in the country takes place in the Fergana Valley. As in the other regions, the depletion of underground reserves and degradation of their quality due to anthropogenic impact are typical. In order to better protect current and potential sources of drinking water in the country, the status of “area of national environmental importance” has been given to eleven zones of fresh groundwater formation. As a result of anthropogenic factors, the groundwater quality continues to deteriorate in some regions of the country, such as the Republic of Karakalpakstan.

One hundred and forty hydrogeological stations in almost all regions have observed the state of groundwater since 1995. The monitoring system covers 99 national groundwater deposits, reservoirs and tail systems, 1,671 wells and 43 springs and includes 1,074 observation stations with automatic devices. Also, groundwater extraction is monitored for 7,000 major water users for different purposes (drinking water, industry and irrigation), with the supply network comprising 45,000 wells, 28,800 of which are functioning and pumping 17.7 million m³/year. Since 2001, the investments in groundwater monitoring and exploration have increased by 15–20 per cent per year, all covered by a long-term programme fully funded by the State (chapter 3).

Drinking water is analysed according to the Uzbek 2000 state standard (O’z DST) on drinking water using modern equipment such as atom absorption spectroscopy, high performance liquid chromatography and enzymatic analysis (polymerase chain reaction). For substances that can be analysed, the World Health Organization and MAC lists are used. Since 2001, additional MACs have been introduced for mercury and chromium.

Out of the 133 mineral water wells with balneological activity, 119 have elevated concentrations of physiologically active compounds¹, salts, gas compositions and higher temperatures, including 81 sites with proven operating reserves and 38 sites with probable stocks in 2005. These include resorts, sanatoriums, preventoriums, rest homes, physiotherapy clinics, factories and mineral water bottling plants. Not all of them are currently in operation, because a number of water facilities need repair and new technical equipment.

6.4 Water use and status of the water infrastructure

In Uzbekistan, general water use is based on the shared use of transboundary and internal water resources of the Aral Sea basin, in accordance with the allocated approved limits, and varies between 45 and 62 km³/year depending on the dryness of the year. Over 90 per cent of this volume is used in irrigated farming (table 6.3).

Consumer water use is based on the principle of equal water supply. Priorities in water delivery among the various sectors of the economy are as follows:

- Drinking and municipal water supply;
- Industry;
- Agricultural and rural water supply;
- Water users approved by special government decision;
- Sanitary releases to irrigation systems and small rivers.

Irrigation

Out of the total volume of water, irrigation consumes about 90 per cent, with an annual consumption of 38.6–59.5 km³ (2002–2008) depending on the availability of water resources. Taking into account

¹ Bromine, boron, iodine-silicon, radon, hydrogen sulphide and iron.



SamAuto enterprise, Samarkand

the importance of agriculture to the national economy and the fact that 16.579 million people in rural areas are directly dependent on water for their livelihood, incomes and welfare, it is extremely important to ensure an adequate water supply to this sector.

Currently, the irrigation system of 4.3 million ha of land consists of 1,600 pump stations with a frequency range of 1 to 300 m³/s and 140,000 km of collectors, and requires an average of 57 km³ of water annually. The irrational and inefficient use of water is the main factor restricting the development of irrigated agriculture. The main reasons for low efficiency are the significant losses through infiltration from the unlined main canals, on-farm irrigation networks and directly through field irrigation water application. Only a small fraction of the water taken from its source is used advantageously.

Over recent years, the Cabinet of Ministers has adopted a number of measures aimed to increase the efficiency of the main canals, thereby improving water delivery. Optimal approaches to irrigation and water management mechanisms at various levels and in various regions of the country are being demonstrated by international organizations and donor countries.

A combination of technical, water management and environment protection measures is envisaged in the irrigated agriculture sector. These include the reconstruction and maintenance of the irrigation and drainage network in order to reduce losses from

canals and irrigated fields, water conservation and an increase in water availability in districts with low supply. About 60 billion sum (about US\$ 41 million) are provided by the public budget for the rehabilitation and reconstruction of the main canals and pump stations.

Under the “optimum” scenario (table 6.4), the efficiency of irrigation systems² should be increased to 0.70 by 2010 and 0.75 by 2025. The efficiency of irrigation water application methods³ is planned to increase on average up to 0.69 in the near future, and up to 0.74 by 2025.

Drinking water

Groundwater is mainly used for domestic and drinking water supplies (173.5 m³/s), irrigation and stock water development needs (70.5 m³/s) and industrial and process water supplies (29.6 m³/s), as shown in figure 6.1.

Groundwater resources provide 80 per cent of the drinking water supply to the population. In general,

² The efficiency of irrigation systems involves various components and takes into account losses during storage, transport and application to irrigated plots.

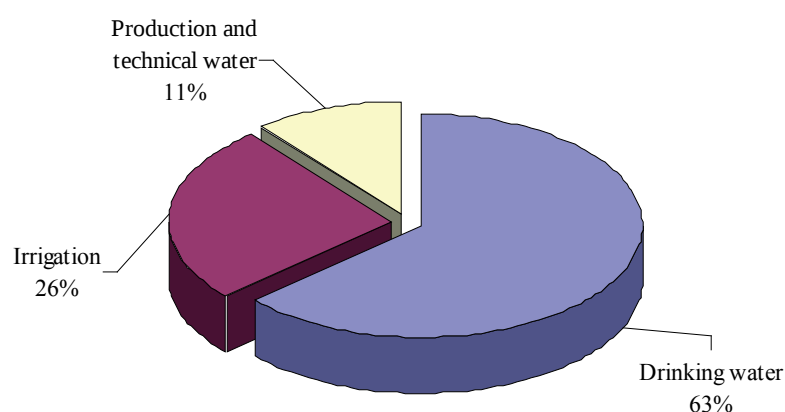
³ Water application methods in Uzbekistan are as follows: surface irrigation; localized irrigation; drip irrigation; sprinkler or overhead irrigation; centre pivot irrigation; lateral move (side roll, wheel line) irrigation; subirrigation; and manual irrigation.

Table 6.4: Irrigation development and water demand for irrigated agriculture

River basin	Area and water demand by development scenarios											
	2010						2025					
	Minimum		Optimum		Maximum		Minimum		Optimum		Maximum	
	mill.ha	km ³	mill.ha	km ³	mill.ha	km ³	mill.ha	km ³	mill.ha	km ³	mill.ha	km ³
Amu Darya	2.3	37.0	2.6	34.0	2.9	33.0	2.3	27.0	2.9	35.0	3.9	39.0
Syr Darya	1.8	22.0	1.9	21.0	2.0	20.0	1.9	22.0	2.0	20.0	2.3	20.0
Total	4.1	59.0	4.5	55.0	4.9	53.0	4.2	49.0	4.9	55.0	6.2	59.0

Source: Global Environment Facility: Water and Environmental Management Project for the Aral Sea basin, A1 Component. National Working Group Final Report, 2002.

Note: Scenarios do not consider changes in dietary habits.

Figure 6.1: Groundwater use in 2008, thousand m³/day

Source: State Committee for Nature Protection, 2009.

Table 6.5: Percentage of water supply coverage, 2000–2006

	2000	2001	2002	2003	2004	2005	2006
Urban	79.8	81.2	84.3	87.3	93.1	95.0	96.0
Rural	72.3	74.9	74.9	75.0	79.1	82.3	85.4

Source: <http://www.statistics.uz>, 2009.

Table 6.6: Percentage of drinking water quality samples not conforming to standard requirements, 2002–2006

	2002	2003	2004	2005	2006
Chemical composition	16.3	15.9	16.3	18.9	11.7
Bacteriological composition	5.1	5.2	5.5	6.0	7.5

Source: State Committee for Nature Protection, 2008.

Note: Samples were taken from municipal water conduits.

the available fresh groundwater resources meet the drinking water demands of the population. However, it should be mentioned that, during the last few years, groundwater quality has been deteriorating, resulting in a reduction in groundwater reserves that can be used as drinking water sources. Groundwater resources in the western territories of the country are reported to have increased in salinity and hardness.

Urban populations are better provided with drinking water. Ninety-six per cent of the urban population is connected to the drinking water supply network; in rural areas this figure declined to 85.4 per cent in 2006 (table 6.5). Drinking water supply problems are very acute in the Bukhara and Navoi regions and the Republic of Karakalpakstan.

Average water supply system efficiency is only 63 per cent, and in a number of regions this figure ranges from 42 to 62 per cent due to various technical and organizational problems, such as obsolete equipment, missing water flow meters, and insufficient reliable data and analysis.

Many people have to use water from wells and irrigation canals. In most cases, this water does not meet sanitary requirements (especially in the summer). Currently, about one third of the country's population consumes drinking water that does not meet the national requirements. The monitoring data reveal the non-conformity of tap water quality to the accepted standards by its chemical and bacteriological composition (table 6.6).

Drinking water consumption (l/day per capita) in rural areas decreased from 180.5 l/day in 1996 to 114.8 l/day in 2004, and in urban areas from 549 l/day to 325.7 l/day due to the introduction of water metering and water pricing.

A significant proportion of municipal and drinking water supply is provided by groundwater. Owing to the uneven distribution of fresh groundwater reserves, some regions have a shortage of drinking water, such

as the Republic of Karakalpakstan and the regions of Khorezm, Bukhara, western districts of Samarkand, Kashkadarya, Jizzakh and Surkhandarya. The goal of the authorities is to provide the entire population with good quality drinking water and to meet the municipal water demands of cities and settlements through centralized water supply systems.

Annual consumption in the period 2002–2008 amounted to between 2.15 km³ and 2.34 km³. The drinking water supply of Tashkent, which has an area of 330 km², 2.3 million inhabitants and a coverage rate of 99 per cent, consists of three main sources with two groundwater deposits and one surface water source providing 2.3 million m³/day over a supply network of 3,500 km. Although there are periods with clear crude water, purification using filtration and chlorination is necessary in order to meet all national and international standards. The use of drinking water in industry is not allowed, with some exceptions for small enterprises.

In 2009, almost all households will be equipped with water meters, which have already been installed in almost all multi-apartment houses and about 50 per cent of all households. Statistics clearly indicate that households equipped with water meters have an average daily consumption of only 140 l/day per capita, whereas households without water meters have an average daily consumption of 580 l/day per capita.

Hydropower production

Twenty-eight hydropower stations produce 12.5 per cent of the electricity. The future development of hydropower in Uzbekistan will be aimed at maximizing the capacity and efficiency of one of the most important renewable energy sources. The plan in the near future is to restore and develop the existing hydropower stations. The total use of water resources by the hydropower sector varied from 3.95 km³/year in 2002 to 5.0 km³/year in 2008 and is estimated at 4.04–4.15 km³/year for 2025 (chapter 8).

Fishing industry

One of the serious consequences of the Aral Sea disaster is the loss of the country's thriving fishing industry, which once provided 20,000 tons of fish annually. The relocation of the fishing industry from the sea to the lake system of the Aral Sea littoral zone has not prevented a steady decline in the region's fish catch.

As a result of this relocation, the fishing industry has been reoriented to pond fish breeding and all the suitable water bodies are now used for this purpose, particularly the Aydar Arnasay Lakes System.

The increase in water mineralization and pollution by toxic substances resulting from the disposal of irrigation return waters and industrial effluent into water bodies has a significant effect on the fishing industry. Despite the fact that this industry is considered a water user rather than a consumer, it consumes around 60 per cent of the 0.368 km³ of annual water intake.

As a result of this increase in capacity, the total water demands of the fishing industry will rise sharply. By 2010, water demand will rise to 2.1 km³/year and will reach 2.4 km³/year by 2025, up from 0.43 km³/year in 2002 and 0.72 km³/year in 2008.

6.5 Wastewater

Collector–drainage water from irrigation

The annual discharge of collector–drainage water into streams and receiving reservoirs amounts to 20–25 km³. The content of nutrients (nitrogen and phosphorus) and pesticides in collector–drainage water is significantly higher than in surface water.

The most mineralized of these waters (up to 9 g/l) are found in the lower reaches of small rivers and the Amu Darya River. To prevent pollution in the Amu Darya River, a package of measures on drainage flow management along the right bank of the river has been developed under the Drainage, Irrigation and Wetlands Improvement Project financed by the World Bank. These measures could make a considerable contribution to saving water in Uzbekistan and in the whole region.

Sewerage in rural and urban areas

Although the in-stream disposal of public utility wastewater has been decreasing in recent years, the purification rate is not sufficiently high. The low operating efficiency of wastewater treatment plants (50–70 per cent against rated capacity) results in an increased concentration of pollutants in surface water streams and depression reservoirs. Treated wastewater is reported to contain increased concentrations of ammonium and nitrites. The situation is most difficult in regions characterized by a water deficit, such as the Republic of Karakalpakstan and the regions of Khorezm and Bukhara, and in areas with a high level of industrial agglomerations (Tashkent, Fergana, Samarkand and Navoi industrial areas).

Therefore, the middle and lower reaches of the majority of regional rivers are characterized by increased water salinity as well as sulphate, chloride, fluoride, mercury, phenol and silicon concentrations that regularly approximate or exceed MAC values.

Given that main water streams can no longer be used as sources for drinking water supplies, adequately providing the population with good quality fresh drinking water is one of the country's most serious problems.

The sanitation network of Tashkent City, which has a coverage rate of more than 90 per cent, has a sewage network of 2,800 km and three sewage treatment plants, which need to be reconstructed. For this purpose, a contract for credit of over US\$ 29 million from the Islamic Bank for Development will be signed in 2009. For industrial wastewater, the local municipal water company (vodokanal) requests the enterprise to ensure the pre-treatment of industrial wastewater. Otherwise, the enterprise must treat the wastewater at its industrial site to reduce the concentrations and charge of the pollutants before releasing it into vodokanal channels.

Industrial wastewater

Uzbekistan's industry withdraws 1.2 km³ of water annually, only 0.58 km³ of which is consumed. Almost half of the withdrawn water is returned in the form of industrial effluent, which poses an ecological threat to the environment. Five hundred and two industrial

Box 6.1: SamAuto: Sustainable water management in industry

SamAuto is an enterprise located in Samarkand which produces buses and trucks. Since industrial processes have an impact on the environment, environmental issues were discussed from the design stage of the factory (ISO 9001 from 1991 to 2007, and ISO 14000 since January 2008).

The company uses groundwater from artesian wells with a backup connection to the municipal drinking water supply network. For this purpose, the enterprise needs a special licence on the basis of a hydrogeological study. About 3 m³ of water per vehicle is necessary during the production cycle. Using a multistep treatment facility consisting of mechanic and chemical treatment processes up to the final step of ion exchange with reclaimable material, a majority of the treated wastewater is used as recycling water in the painting box. The rest of the purified wastewater is discharged into the municipal sewage network, for which the company must pay fees according to the water meter charges and the analysed residual concentration of pollutants. Scheduled inspections are carried out in periods of two to three years, whereas, if failures occur, the inspection period is shortened to one year (See chapter 2: Compliance and enforcement mechanisms).

The next step in development will be the use of water-based paints instead of paints containing organic solvents; this will be checked over a one year period.

enterprises dispose of around 0.14–0.17 km³/year of poorly purified effluent containing heavy metal salts, fluorides, phenol, petrochemicals, all nitrogenous groups, and biological and other pollutants specific to particular industries into surface water bodies (box 6.1). About 1–5 per cent of industrial water, from more than 100 enterprises, is disposed of into streams without treatment.

Industrial production accounts mainly for water pollution by heavy metals, phenols and oil products. Industrial, household/municipal and collector–drainage waters disposed of in streams contain 8 to 15 pollutants whose concentrations exceed the MAC values for domestic/drinking water supplies and fishery waters by 2 to 10 times.

As part of restructuring the country's economy, industrial water consumption will be oriented to closed cycles of water use that will allow a reduction in consumptive water use by up to 24–25 per cent. Total intake for industrial needs will increase to 1.4 km³/year by 2010, and 1.6 km³/year by 2025, from the current level of not more than 1.2 km³/year. In recent years, the share of industrial water recycling has been increasing, with the highest rate of water recycling found in the industrial enterprises of the Tashkent, Navoi and Fergana regions.

management, ensuring guaranteed water delivery and providing essential services both to society and natural ecosystems for the reconstruction, operation and maintenance of the existing infrastructure.

The water sector reform began with the adoption of the Cabinet of Ministers Resolutions on the transition from an administrative territorial approach to a two-level system of basin irrigation management, involving the introduction of market relationships at all levels of water use through the 2003 Cabinet of Ministers Resolution on Improvement of the Activities of the Ministry of Agriculture and Water Management and the 2003 Resolution on the Improvement of Water Management Institutions.

The transition from the territorial management principle with its strict centralized approach, to the more flexible systems approach based on basin principles, is fundamental for these resolutions. Internationally, basin-based integrated water resources management (IWRM) is the prevailing paradigm in managing water resources. The creation of the two-level system of national water resources management through the establishment of the basin administrations of irrigation systems (BAISs) and water user associations (WUAs) has become the most important component of the on-going reforms.

6.6 Water policies and strategies

Policy objectives

The main aim of the Government's water sector policy is to promote the rational use of water and to protect water resources. It also aims to improve the efficiency and reliability of the country's water sector

Legislation

The most important legal document is the 1993 Law on Water and Water Use, with its December 2007 amendments. The Law contains significant provisions on regulating the water sector's rational use of water for the needs of the population and the national economy; protecting water from pollution

and depletion; preventing and eliminating other negative impacts on water; improving the condition of water bodies; protecting the rights of enterprises, institutions, organizations, private farms and dekhkans (small family farms) and citizens in relation to water. The Law is currently under revision, with proposals to include the different categories of water consumers, water users and water bodies.

The 1999 Law on the Safety of Waterworks is aimed at ensuring safety in the design, construction, commissioning, reconstruction, restoration, conservation and demolition of water structures. Many important aspects of state management, use and protection of water resources are regulated by by-laws and Cabinet of Ministers Resolutions, for example the 2002 Law on Granting the Status of Specially Protected Natural Territories of National Value to Formation Zones of Groundwater.

In line with government priorities, an Oliy Majlis commission, together with governmental agencies and stakeholders, is preparing a law on WUAs, as well as a new version of the Law on Water and Water Use and other legal acts.

Since 2001, eight Cabinet of Ministers resolutions have been adopted concerning rivers, and three concerning groundwater. They ensure, among others, an improvement in the organization of water resources management and irrigation management, the regulation of all water use, and the preservation of protected natural areas through the withdrawal of facilities that represent a danger to the environmental from the water protection zones of the eight major rivers. So far, 155 such facilities have been withdrawn. An inventory of groundwater sources and measures to safeguard water protection zones along the designated areas of fresh groundwater abstraction are being carried out.

Implementation of strategies and programmes

The 2002 Concept of Integrated Sustainable Water Supply sets forth the principal objectives for water management and amelioration measures for 2008–2011. These directives envisage major improvements in land use through better drainage, an increase in the efficiency of agricultural water supply through irrigation modernization, and the introduction of IWRM.

Closely related to the Concept is the 2001 Strategy for the Development of the Irrigation and Drainage Sector and the National Programme on the Development of Irrigation for 2000–2005. Together, these two documents are important instruments for implementing water resources management policy, which is of prime importance for agriculture and the environment.

Uzbekistan participates in the European Union Water Initiative, whose political support is strengthened by European Union commitment to achieve the key tasks associated with water, such as reducing the number of people without access to safe drinking water and sanitation by 2015, or the development of IWRM and efficient water use planning by 2015. The development of Uzbekistan's national IWRM strategy will help to overcome the existing barriers and adaptation to the changes in water and land use associated with the expected demographic growth, migration and the growing demands of the population.

The following activities were carried out in the country under the relevant programmes and projects:

- (1) The IWRM Fergana Project (2001–2005), which increased the field application efficiency of irrigation water from 42–51 to 69–81 per cent.
- (2) The IWRM-orientated drainage project for the Right Bank Collector with a package of technical interventions, as well as all possible options and scenarios for collector–drainage water management.
- (3) The restoration of the Lake Sudoche wetlands in the Amu Darya River delta.
- (4) The establishment of the Nuratau-Kyzylkum Biosphere Reserve.
- (5) Projects focusing on improving the knowledge on and awareness of IWRM, such as the ZEF (Center for Development and Research)/United Nations Educational, Scientific and Cultural Organization Project on Sustainable Management of Land and Water Resources in Khorezm, carried out with financial support from the international community, which will contribute to the successful introduction of IWRM in Uzbekistan.

The State Programme on Providing the Rural Population with Drinking Water and Natural Gas for the Period 2000–2010 is intended to extend water supply network coverage to 85 per cent of the population and to reduce per capita consumption in cities through, for example, installing meters,

eliminating leaks and changing water consumption rates. The Programme also envisages providing alternative water supply sources for remote areas that cannot be reached through conventional means.

The 1998 National Environmental Action Plan for 1999–2005 predetermines state policy aimed at improving the quality of surface water and groundwater. The Programme of Actions on Nature Protection for 2008–2012 includes measures on water treatment plants, the reconstruction of sewage plants and the construction and maintenance of water pipelines.

6.7 Institutional setting for water resources management and protection

State water resources management at the national level is carried out by the Cabinet of Ministers through the Ministry of Agriculture and Water Management, the State Committee for Nature Protection (SCNP), the State Committee on Geology and Mineral Resources and state local authorities. The responsibility for national water use and protection is shared by corresponding local authorities at the regional and district levels.

The Ministry of Agriculture and Water Management is the state body responsible for water resources management. It plays the key role in implementing state policy on water management and use, and coordinates the work of the water management bodies in Uzbekistan. The main tasks of the Ministry of Agriculture and Water Management relating to water management are the following: the development of policy in the agricultural and water resources sector; the introduction and development of new technologies in the area of agriculture and water resources; the coordination of the activities of commercial service enterprises and organizations; investments in irrigation and drainage systems to improve water resources management; the development of policies and procedures for basin organizations; assistance for the development of WUAs; the introduction of IWRM at the river basin level; the creation of strong research institutions; and the establishment of training courses for the improvement of on-farm irrigation.

The basin administrations of irrigation systems (BAISs) are regional bodies under the Ministry of Agriculture and Water Management. The main tasks of BAISs, which were established on the basis of existing structures, are to manage the purposeful and rational use of water resources; to implement

an integrated technical water management policy; to ensure the uninterrupted and timely delivery of water to users; to ensure the rational management of water resources within the basin; and to ensure the reliable measurement of water use.

The State Committee on Irrigation and Drainage coordinates irrigation and drainage activities. Members of this Committee are the heads of large water management organizations and deputy khokims (governors) of the regions responsible for water management issues.

Uzkommunkhizmat is the government agency responsible for communal services. It was established in 2000 and replaced the Ministry of Municipal Services. The main tasks of this agency are to ensure the stable and reliable operation of interregional water pipelines; to design and implement an integrated technical policy on the exploitation and development of interregional water pipelines; and to develop proposals/initiatives for the normative and legal framework and for monitoring the technical and economic conditions affecting municipal services.

Under the authority of the khokimiyat (local authority) and the agency, the regional municipal and exploitation associations are responsible for municipal services at the local levels.

The SCNP is the main executive agency in the area of the environment and the protection of natural resources. It is responsible for the control and improvement of surface water use and compliance with legislation on nature protection. Therefore, it has inspectorates, including the State Specialized Inspectorate for Analytical Control. It develops and implements environmental protection measures. The Committee is under the direct authority of the Oliy Majlis.

The State Committee on Geology and Mineral Resources is responsible for monitoring and managing groundwater.

Uzhydromet monitors the hydrological regime of rivers, lakes and reservoirs, and is responsible for monitoring the water quality of rivers, lakes and reservoirs.

The Sanitary and Epidemiological Stations ensure the epidemiological safety of the population. At the state level, the Stations are subdivisions of the Ministry of Health. At the regional and district levels, they are

under the authority of the relevant khokimiayt. The Stations are responsible for monitoring drinking, municipal and irrigation water quality in order to prevent contamination by harmful substances.

WUAs are associations of the newly established private farms and other commercial entities providing services in water distribution and the operation and maintenance of on-farm irrigation and drainage systems. The first WUAs were set up from 1999 to 2000, when the reform of the unprofitable collective farms led to the establishment of private farms, which in turn were integrated into farmers' associations. These associations formed the basis from which the first 13 WUAs emerged. Now there are 1,693 WUAs in Uzbekistan. Although the WUAs are a new type of non-governmental organization in the area of land and water use, they already served around 2.8 million ha in 2005 and are responsible for approximately 70,000 km of irrigation channels and 50,000 km of drainage networks.

In order to overcome the limitations of the existing legal system, in November 2004, a special government commission was established to make decisions concerning the development of WUAs. The following decisions were made: to develop a law on WUAs; to strengthen the role of WUAs in planning and managing the rational use of water resources on irrigated lands and the promotion of sustainable IWRM; to encourage WUAs to make better use of their water resources through the introduction of advanced irrigation water application technologies, which reduce the volume of water supplied per hectare; to develop a special programme for the introduction of modern irrigation water application technologies and a review of issues associated with financing farmers; and to assist WUAs in introducing water meters for precise measurements and calculations of the water volumes used by farmers.

6.8 Conclusions and recommendations

Over 50 per cent of the lands located in the alluvial plains suffer from salinity and overwatering. Land salinization is a natural process typical of all intermountain, alluvial and proluvial areas of the arid zone. However, the main reasons for soil salinization include partial drainage-free irrigation, which is equal to 22 per cent, huge infiltration losses, the construction of unlined canals, over-irrigation, uncontrolled water supply and the use of saline water for irrigation purposes.

Although Uzbekistan plans to increase irrigation efficiency, it has achieved progresses in the area of water supply and sanitation and has had its first experiences with IWRM implementation, much remains to be done. It is necessary to create the basis for the sustainable use of water resources and for future water management, as well as to further improve the supply of drinking water that meets national requirements, in line with international recommendations, and wastewater treatment all over the country to guarantee public health and a clean environment.

Therefore, it is necessary to avoid the tremendous losses caused by inefficient irrigation techniques, infiltration via unlined irrigation canals and ditches as well as evaporation losses, which lead to soil and groundwater salinization, waterlogging and collector–drainage runoff that contains agrochemicals such as fertilizers or pesticides, by far the main surface water pollutant.

It must be ensured that restoration procedures cover not only the irrigation network's main canals and pump stations, but also practices at the level of WUAs and farmers, who need adequate training in using modern measures such as underground and overnight irrigation and financial support for the restoration of their equipment. Retired farmers who have many decades of experience in irrigation could be employed as senior experts to support the implementation of sustainable water use in agriculture.

Plants would be given just the water that they required through the introduction of water metering, adequate water fees, water-saving incentives and water dissipation penalties for all water users in agriculture.

Recommendation 6.1:

The Ministry of Agriculture and Water Management, together with the basin administrations of irrigation systems and water user associations, should implement water-saving measures for irrigation, including:

- (a) Minimizing infiltration via unlined irrigation canals and ditches;*
- (b) Implementing modern water efficient irrigation techniques.*

IWRM will help to improve water productivity, especially in arid areas. It must not only ensure the drinking water supply, but also meet the reasonable

demands of agriculture and other sectors of industry, as well as environmental demands. Therefore, participative methods including all these groups and the promotion of institutional learning are indispensable. The experience gained and lessons learned in the region, with the support of the international community, will help to increase the possibility of a successful transition to IWRM principles and approaches in Uzbekistan, requiring a legislative reform process, the appropriate institutional development at the regional and district levels and powerful management tools.

The key measure is to identify a priority list for investments in sewerage and wastewater treatment, covering the construction of new, and restoration of old, installations and their scheduling and funding arrangements. This must be accompanied by training for wastewater treatment facility staff in plant operations, process controls, instrument operations and equipment maintenance.

Furthermore, it is necessary to formulate a long-term water pricing strategy that covers the full costs of investments, operations and maintenance of the wastewater infrastructure. Social or undue hardships should be avoided if appropriate solutions are found.

Another goal is to ensure that industrial wastewater is fully treated. This wastewater often contains hazardous substances such as heavy metals, phenols and oily products, which pollute surface waters when disposed of into streams or hamper the effectiveness of municipal sewage plants when disposed of into the vodokanal canalizations.

Recommendation 6.2:

The Cabinet of Ministers should:

(a) *Develop and introduce legal acts on integrated water resources management principles;*

(b) *Establish an appropriate structure with sufficiently high status focused on integrated water management planning and responsible for ensuring the coordination of actions in the water sector; and promote the required institutional development, taking into account international experience;*

(c) *Establish a mechanism with stakeholders from the Government, non-governmental organizations, academia and the private sector to initiate and carry on a national policy dialogue on integrated water management within the framework of the European Union Water Initiative, as well as the UNECE Water Convention and its Protocol on Water and Health, with the UNECE as key strategic partner.*

In accordance with recommendation 6.2, a long-term water pricing strategy with full cost coverage for the drinking water infrastructure is necessary, as well as the introduction of water metering for all water users. Many people, especially in the near Aral Sea region, have to use water from wells and irrigation canals which does not meet sanitary requirements. The improvement of the sanitary living conditions of these people and the prevention of dangerous intestinal diseases also depend on the state of sanitary waste and sewage treatment systems. For these people, as well as those in isolated rural settlements, local solutions or long-distance water supply are required.

Recommendation 6.3:

(a) *The Agency Uzkommunkhizmat and the local authorities should improve the efficiency of wastewater treatment.*

(b) *The Cabinet of Ministers should develop a national strategy and a long-term programme in order to identify the aims, priorities and financial resources for the water supply and wastewater treatment infrastructure, and the Agency Uzkommunkhizmat and the local authorities should implement this strategy.*

Chapter 7

LAND MANAGEMENT AND PROTECTION

7.1 Introduction

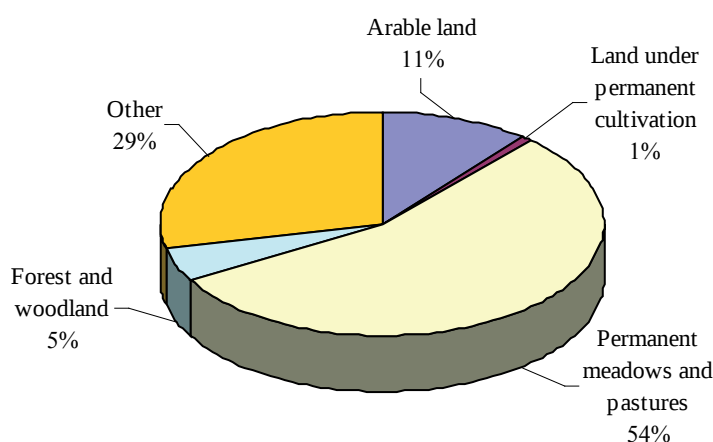
Most of Uzbekistan's territory is situated between two of Central Asia's largest rivers: the Amu Darya and Syr Darya Rivers. The country has a harsh continental climate with four distinct seasons and wide seasonal and diurnal variations in temperature. The territory of Uzbekistan can be divided into plains, foothills and mountainous zones.

The desert belt (chul) is the zone used for irrigated farming and Karakul sheep herding, and has annual precipitation of 100–250 mm. The foothill plains belt (adyr) is the zone of very low precipitation. The mid-mountain belt (tau) is the rain-fed land, where normal annual precipitation is over 400 mm. Along with rain-fed grain farming, the belt is favourable for fruit production. The high-mountain belt (yaylau) is characterized by meadow steppe vegetation. Permanent meadows and pastures cover more than half of the land area (figure 7.1).

Agricultural production, while depending on land and water, has significantly affected, and is affecting, the state of these vital resources. Agriculture is one of the key sectors of Uzbekistan's economy, contributing to gross domestic product (GDP) by 30.7 per cent in 2007. With regard to food security, agriculture accounts for 80 per cent of the entire food consumption in Uzbekistan.

Agriculture is the most important sector in Uzbekistan. The Uzbek population has increased rapidly, from 8.4 million in 1960 to 26.7 million in 2007 (population growth rate at present is 1.732 per cent). In 2007, 64.1 per cent of the total population lived in rural areas. Sixty-three per cent of the rural population made their living in agriculture. Eighty-eight per cent of the population lived under the threat of desertification, with this figure likely to increase as a result of climate change. With 32.4 per cent of the population being under the age of 14 years, there is a high potential for migration to urban areas if a rapid

Figure 7.1: Land use in 2002



Source: World Bank: <http://siteresources.worldbank.org/INTEEI/Data/20859184/Uzbekistan.pdf>

decrease in incomes occurs in the rural areas. Also, so as to prevent migration from the rural areas and social frictions, sustainable development in the agricultural sector should be given high priority in Uzbekistan.

Uzbekistan's vast irrigation system was created in the 1960s and thereafter. Cotton is the most important cash crop, with Uzbekistan still being the world's second largest cotton exporter after the United States. This said, there have been significant reforms to favour the production of wheat and other food crops on irrigated land in order to meet domestic demand by halving the territory used for cotton cultivation. The overall management of irrigated land is facing new challenges in terms of sharing water with neighbouring countries and the increased need to manage climate uncertainty. Indicators on the management of rain-fed agricultural land, pastures and livestock breeding reveal unsatisfactory trends. Overgrazing is a problem in much of the livestock breeding areas, causing the carrying capacity to be exceeded both in the vicinity of populated areas as well as in the more remote extensively used lands. Reductions in pasture efficiency of 20–25 per cent are reported in many regions of Uzbekistan, and about 10 million ha of pastures require radical improvements.

Land reform is being rapidly developed and poses challenges and opportunities in seeking improvements and sustainability in the area of land management.

7.2 Legal, regulatory and institutional framework: main developments since 2001

Legal and regulatory framework

The 1993 Law on Water and Water Use was amended in 2003 and 2007. A new draft law on water and water use is also under preparation and addresses, among others, the management of water used for irrigation. Since about 90 per cent of consumed surface water, depending on the year and water availability, is used for irrigation, this law also contains provisions related to land management and protection. The environment-related paragraphs of the draft law comprehensively address different aspects of protection measures, for example, by defining water user obligations.

The 1998 Land Code was amended in 2003, 2004 and 2007. A new land code has been drafted and is currently under consideration by the competent authorities. The main responsibility for this issue lies with the State Committee on Land Resources, Geodesy, Cartography and State Cadastre. In

comparison with the 1998 Land Code, the new code has a significantly greater number of articles addressing environmental issues, in particular land protection.

The 2000 Law on State Cadastres refers to 20 cadastres being created in the country. The state land cadastre realizes the functions of recording and surveying and the registration of land plot rights. The 1998 Law on State Land Cadastre states that land cadastre also includes land quality, soil appraisal, land cost, systematization and the holding and renewal of land cadastre information. Ownership and other rights to plots of land, easements, limitations and the transferral and cessation of rights are liable for registration.

The Law on Increasing the Soil Fertility of Agricultural Lands entered into force in Uzbekistan in 2006. With regard to the improvement of agricultural land, the Presidential Decree on the Improvement of Irrigated Agricultural Lands entered into force in October 2007. The State Programme for the Amelioration and Improvement of Irrigated Lands for 2008–2012 focusing on the preparation and renewal of the irrigation infrastructure supports the implementation of this Decree with an annual financing of 60 billion sum from the state budget.

The 1993 Law on Specially Protected Natural Territories was replaced in 2004 by the Law on Protected Natural Areas (chapter 1).

The Programme of Actions on Nature Protection for 2008–2012 addresses in great detail the management and protection of water and land resources.

Institutional framework

The Government made a significant administrative reform by merging various entities responsible for land use. In 2004, it established the State Committee on Land Resources, Geodesy, Cartography and State Cadastre by merging the State Committee on Land Resources and the Administration of Geodesy and Cartography (for rural lands), the Bureau of Technical Inventory (for residential buildings) and the State Cadastre (for urban land and non-residential buildings). The State Committee on Land Resources, Geodesy, Cartography and State Cadastre is responsible for the following:

- Ensuring the implementation of state policy on the rational use of land resources, regulating land relations, ensuring land management, monitoring

land conservation, and improving soil fertility and restoration;

- Developing and implementing state programmes to improve soil fertility and the rational use and protection of land;
- Implementing state control over the management and protection of land;
- Managing geodetic and cartographic activities;
- Coordinating government agencies and public authorities in the area of surveys on public conduct;
- Maintaining state land cadastres, state maps and geodesic inventories, inventories of public buildings and facilities, as well as a unified system of state inventories.

The Ministry of Agriculture and Water Management is the primary decision-making body for agriculture. It is responsible for the following:

Developing a unified policy for agriculture, based on professional knowledge and the effective and rational use of land, water and forest resources;

Coordinating activities to further reform agriculture and monitoring reform procedures, restructuring agricultural production, and providing practical assistance to the new shirkats (large agricultural cooperatives) and farmers in their relations with purchase and service organizations;

Developing an effective investment policy;

Promoting modern agro-technologies and establishing a monitoring system for agricultural production aimed at increasing export profits;

Considering the structure and volume of agricultural crops according to the requirements of both international and domestic markets;

Developing livestock breeding, and veterinary and other services;

Protecting water resources and ensuring their rational use, managing the state water cadastre and taking measures to improve irrigated land.

Monitoring land resources

The responsibility of monitoring land resources is shared between several authorities. The State Committee for Nature Protection (SCNP) is responsible for the monitoring of environmental pollution sources, including in soil and areas adjacent to toxic chemical landfills and tailing dumps. Uzhydromet (the Centre of Hydrometeorological Service) is responsible for monitoring pollution on agricultural land. The Ministry of Agriculture and Water Management gives recommendations on agro-technologies. The State Committee on Land

Resources, Geodesy, Cartography and State Cadastre monitors land pollution and soil quality. In addition, the State Committee on Geology and Mineral Resources and the Ministry of Health participate in monitoring within their respective fields of responsibility.

The State Committee on Land Resources, Geodesy, Cartography and State Cadastre is preparing a comprehensive report on the quality of irrigated agricultural land by using the formerly established and complex bonitet¹ quality indicator (scale 0–100). The work will be finalized in 2013. The Atlas of Land Resources will be published in 2009 as well as the Atlas on Vegetation. A report on the state of land resources, describing, among others, the quantitative and qualitative conditions of soils, is published annually.

International cooperation

Ample and up-to-date information on land management and protection has been, and is being, produced and compiled within the framework of Uzbekistan's work as a party to United Nations conventions, namely the United Nations Convention to Combat Desertification in Countries Experiencing Serious Drought and/or Desertification, Particularly in Africa (UNCCD), the Convention on Biological Diversity and the United Nations Framework Convention on Climate Change (UNFCCC). The National Capacity Self-Assessment for Global Environmental Management of Uzbekistan was finalized in 2006 and addressed all three Conventions.

The assessment determined the priority capacity development needs relating to global environmental management commitments.

Uzbekistan's National Action Programme to Combat Desertification was adopted in 1999 and a national report was prepared in 2002. Since then, a large number of international cooperation projects have started, including a project for the implementation of the UNCCD, within the Central Asian Countries Initiative for Land Management (CACILM). The CACILM partnership involves the five Central Asian countries and the donor community at large. The Asian Development Bank has a coordinating role.

¹ The bonitet ratio is an indicator of soil fertility, which takes into consideration humus content, soil structure, salinity and other parameters.



Bukhara region. Jeyran Ecological Centre. Salty lake

In Uzbekistan, Uzhydromet, as the focal point for the UNCCD and given that it chairs the National Working Group established for the Convention, also coordinates CACILM cooperation.

7.3 Trends in protection and quality change of irrigated land

The area of agricultural land under irrigation is about 4.3 million ha, out of which 3.3 million ha are used for the production of annual crops, predominantly cotton and wheat. There has not been a major change in the irrigation area since 2001. Climate change scenarios predict increased water scarcity, and extensive irrigation methods are the main factors limiting the otherwise existing potential to extend the agricultural area. Agricultural production from irrigated land accounts for 95 per cent of the gross agricultural output.

The main problems related to land management are the same as those discussed in the 2001 Environmental Performance Review (EPR), namely, soil salinity, soil erosion and the contamination of soil by harmful substances. Table 7.1 gives the proportions and areas of irrigated land under annual cultivation belonging to different quality classes (using the bonitet quality indicator, scale 0–100) in different regions of Uzbekistan. The greatest problems with soil quality can be observed in the

Republic of Karakalpakstan and the regions of Bukhara, Navoi and Khorezm.

According to the State Committee on Land Resources, Geodesy, Cartography and State Cadastre, ongoing soil quality mapping suggests that the slightly weakening trend observed until 2002 has turned into a stable situation and that many regions have experienced a slight improvement in quality. Table 7.2 gives the area and percentages of irrigated land under the categories “good”, “satisfactory” and “dissatisfactory”. According to this source, similarly, a slightly improving trend in soil quality can be observed between 2002 and 2008. The table gives a breakdown of the land in a dissatisfactory state by the main cause or causes of degradation (soil water regime or salinity, or both).

Despite the stabilization after the more negative trend in the 1990s, the situation concerning land management and soil protection gives cause for concern. The overall degree of land degradation in irrigated areas is high, with about 55 per cent suffering from degradation and decreased fertility levels in some form. About 78,000 ha of irrigated land is completely marginalized due to salinization and/or elevated groundwater level. Eight per cent of the country’s irrigated land area is reported to be exposed to irrigation erosion (2 per cent is moderately or severely eroded). Fifteen per cent of irrigated

land is exposed to soil drifting. Ravine erosion is also a problem on irrigated land. This is caused by the breakthrough of irrigation ditches and by other unregulated currents of irrigation water in fields where the surface slope is significant.

Unsustainable management practices are widespread and pose the threat of further degradation. The lack of adjusted and diversified crop rotation and large-scale cotton and wheat production areas, together with low rates of organic fertilizer use and the minimum use of legume crops, tend to result in low organic matter content in the topsoil and lower fertility rates. Also, the application of mineral fertilizers has decreased. Excessive, and sometimes unnecessary, tillage affects soil structure and causes compaction.

Water use in agriculture is a crucial factor. About 90 per cent of the used surface water is used for irrigation. Over-irrigation and water loss are widespread and the lack of proper land-levelling is contributing to the problem. Land-levelling also gives options for enormous water savings with only moderate additional efforts, when research results can be disseminated and farmers provided with a minimum of support. The excessive discharge of irrigation water without adequate drainage leads to flooding and waterlogging. In some cases, there is reported to be a 50 to 60 per cent loss of irrigation water between the main canal system and the fields. However, the average is about 36 per cent.

Many of the above-mentioned problems are being addressed by the Uzbek authorities at different levels, for example in the State Programme for the Amelioration and Improvement of Irrigated Lands for 2008–2012. A special fund supporting the renovation of the main irrigation channels has been established (further discussion under section 7.8). The Presidential Decree on Measures for Optimizing Areas under Cultivation and Increasing Food Crop Production entered into force in October 2008. Starting from 2009, the area used for cotton cultivation will diminish by 75.8 thousand ha. By increasing the production of fruit and vegetables, this Decree enables an improvement in farming techniques and crop rotation. It also has significant socio-economic consequences.

Soil salinization and erosion on irrigated land are closely related to the choice of crops, water economy and farming techniques. The amount of irrigation water required for cotton is high, and significantly higher than that required for wheat. Conservation

agriculture, saving water and protecting the soil from erosion should be tried out in pilot projects and encouraged.

Existing scientific research provides evidence that a reduction of up to 20 per cent or more in leaching and irrigation water, together with other benefits, can be achieved just by using laser-guided land-levelling,² which has been developed and tried in Uzbekistan³. Direct sowing and mulching should be more widely included in the methods used in trials. According to some research results from the ZEF (Center for Development and Research)/United Nations Educational, Scientific and Cultural Organization (UNESCO) Project on Sustainable Management of Land and Water Resources in Khorezm, intercropping cotton with grain legumes does not necessarily decrease the cotton yield, and makes it possible to produce another valuable crop and improve soil quality (box 7.1). High-tech water-saving technologies such as drip and sprinkler irrigation systems need high initial investments, whereas short furrows, mulching, laser-guided land-levelling and the use of hydrogel are less capital intensive.

Water management at the farm level can be improved by providing farmers with education, financial support and other services. Water pricing as a method to provide incentives for more rational use, combined with soil salinity reduction, should be looked into. The envisaged differentiated tariff system and payments for wasteful water use may improve the situation as an initial step to internalize water costs into the production systems. However, the incorrect implementation of water-saving procedures may lead to increased soil salinity, which must be avoided. Hence, water and land management improvements must go hand in hand.

7.4 Soil salinization

The problem of soil salinization on irrigated land most affects the midstream and downstream Amu Darya and Syr Darya basins. Widespread salinization leads to a significant decrease in agricultural crop production, having economic and social consequences. Land salinity estimates vary depending on the source. According to the United Nations

² A laser transmitter is used to achieve exact levelling. The process must be repeated every five to eight years.

³ Summary in Science Brief (ZUR) No. 1 from the ZEF/UNESCO Project on Sustainable Management of Land and Water Resources in Khorezm, Uzbekistan.

Table 7.1: Soil quality of irrigated land under annual cultivation, ha

Republic and regions	Bad		Below average		Average		Good		Very good		Total	Average of bonitet index
	Class I	Class II	Class III	Class IV	Class V	Class VI	Class VII	Class VIII	Class IX	Class X		
	Rating according to the bonitet index											
	0–10	11–20	21–30	31–40	41–50	51–60	61–70	71–80	81–90	91–100		
Karakalpakstan	..	1,919	29,810	237,202	69,846	46,458	24,497	6,801	..	..	416,533	41
Andijan ^a	..	311	9,593	34,322	39,801	45,187	50,547	38,267	6,015	35	224,078	57
Bukhara ^b	..	1,038	16,521	57,391	42,070	55,294	40,843	19,456	83	..	232,696	50
Jizzakh	..	105	3,607	40,717	143,261	48,533	30,379	7,413	2,809	..	276,824	50
Kashkadarya	..	..	3,455	71,977	198,976	87,416	50,375	25,003	8,177	..	445,379	51
Namangan	..	235	13,499	45,776	47,117	36,667	32,553	33,383	18,181	1,301	228,712	59
Navoi	..	3,358	9,618	15,253	17,668	18,200	20,423	12,853	2,099	..	99,472	52
Samarqand	..	41	2,044	29,478	72,263	89,756	57,187	38,321	16,770	547	306,407	57
Surkhandarya ^c	..	704	11,047	43,203	59,838	79,317	50,049	20,985	6,915	..	272,058	56
Syrdarya ^d	..	..	1,739	36,344	93,772	60,918	51,580	7,694	8	..	252,055	52
Tashkent	..	..	2,631	37,586	86,361	67,968	74,385	45,380	14,600	29	328,940	59
Fergana	..	1,426	8,043	59,139	56,142	58,386	67,580	33,001	5,570	452	289,739	56
Khorezm ^e	..	625	8,839	46,296	34,932	82,052	49,291	11,848	102	..	233,985	53
Total	..	9,762	120,446	754,684	962,047	776,152	599,689	300,405	81,329	2,364	3,606,878	55

Source: State Committee for Nature Protection, 2009.

Notes:

a Data from the Andijan region is based on the 2002 soil evaluation.

b Data from the Surkhandarya region is based on the 2003 soil evaluation.

c Data from the Bukhara region is based on the 2004 soil evaluation.

d Data from the Khorezm region is based on the 2005 soil evaluation.

e Data from the Syrdarya region is based on the 2006–2007 soil evaluation.

Data for other regions is based on soil evaluation up to 2001.

Table 7.2: Categories of irrigated land in area and percentage, 2002–2008

Year	Total	Good		Satisfactory		Dissatisfactory		Causes of dissatisfactory quality		
	1,000 ha	1,000 ha	%	1,000 ha	%	1,000 ha	%	Elevated groundwater table	Salinity	Both
2002	4,253.8	1,719.8	40.4	2,185.3	51.4	348.7	8.2	156.2	115.2	77.2
2003	4,261.8	1,719.5	40.3	2,170.0	50.9	372.2	8.7	197.1	80.0	95.1
2004	4,266.2	1,682.8	39.4	2,214.7	51.9	368.8	8.6	192.6	80.4	95.7
2005	4,273.6	1,720.5	40.3	2,207.0	51.6	346.1	8.1	185.9	65.4	94.9
2006	4,281.8	1,750.0	40.9	2,193.3	51.2	338.0	7.9	175.0	60.1	102.7
2007	4,290.0	1,779.0	41.5	2,172.0	50.6	338.7	7.9	170.1	87.8	80.5
2008	4,289.8	1,821.7	42.5	2,159.1	50.3	317.8	7.4	148.8	72.3	96.6

Source: State Committee for Nature Protection, 2009.

Development Programme, over 50 per cent of the irrigated area is classified as saline, with about 5 per cent being severely saline. According to the SCNP, saline land covers 2,179 thousand ha (or almost 52 per cent of the irrigated land), including 1,345 thousand ha of slightly saline land (32 per cent), 665 thousand ha of moderately saline land (16 per cent) and 168.9 thousand ha of severely saline land (3.93 per cent). Uzbekistan's UNCCD National Working Group reports a proportion as high as 53 per cent (2,279 thousand ha) of the irrigated land as suffering from salinization, with 47 per cent of this area being moderately or highly saline. The area of saline land has decreased by 91 thousand ha in the period 1996–2006.

Secondary salinization is caused by the rise of the groundwater table and salt accumulation in the root zone. Leaching the salt with excessive amounts of irrigation water further increases the risk of elevated water tables and waterlogging. Valuable scientific research and experiments on the management of saline soils and the rehabilitation of severely saline and waterlogged soils, including biodrainage and bioremediation, are available in Uzbekistan. The rehabilitation of saline land on a larger scale supported by agricultural extension services, however, is not yet taking place. Map 7.1 shows the level of salinity of irrigated land by region.

Attempts were made to address the Aral Sea dried seabed and spreading of accumulated salts, together with contaminants and soil particles, by using afforestation. Over 1.3 million ha of exposed seabed is located in Uzbekistan's territory. The pace of creating shelter forests in the Aral Sea dried seabed has been about 15–20 thousand ha per year over 15 years.

7.5 Soil pollution

The use of pesticides and mineral fertilizers has significantly decreased in Uzbekistan over the last 10 to 15 years. The Uzbek authorities and research institutions have made a commendable effort to develop integrated plant protection practices and to shift to less harmful chemicals and biological plant protection. The present use of pesticides is at the level of 0.4 kg/ha on arable land, whereas during the Soviet era this figure was 15–19 kg/ha.

Despite this development, soil pollution by fertilizers and pesticide residues remains a problem in many regions. As an example, contamination by DDT⁴ residue aggregate in the regions of Andijan and Fergana exceeds the maximum allowable concentration by 2.4 to 6.1 times. The amount of unused obsolete pesticides, which must be disposed of or destroyed, is reported to be 1,500 tons. The spreading of toxic substances and salt in dust storms from the exposed Aral Sea seabed is a situation of concern for land and water quality, and a direct threat to human health.

7.6 Pasture degradation

In terms of surface, pastures are the most widespread form of land use for agricultural purposes, covering 21–22 million ha. Out of this area, depending on the source and the classification used, some 15–18 million ha are occupied by desert pastures, 3–5 million ha by foothill pastures and over 1 million ha by mountain and high-mountain pastures.

Cattle husbandry is closely related to fodder production and takes place in the vicinity of inhabited

⁴ Dichlorodiphenyltrichloroethane.

Table 7.3: Livestock dynamics for selected years in the period 1990–2005

Species	1990	1995	2000	2001	2002	2003	2004	2005
Total cattle (1,000)	4,580	5,848	5,268	5,344	5,478	5,879	6,243	5,400
of which cows (1,000)	1,856	2,337	2,305	2,364	2,293	2,557	2,704	2,800
Sheep and goats (1,000)	9,230	10,049	8,886	8,930	9,234	9,929	10,580	10,500
Horses (1,000)	120	145	155	150	145	145	145	145
Pigs (1,000)	716	350	80	89	75	90	87	90
Poultry (1,000)	26,473	18,500	14,787	14,800	15,725	18,053	19,184	18,350

Source: FAOSTAT, 2006.

and irrigated land or artesian water wells. Leguminous forage crops, particularly alfalfa, work excellently for crop rotation with cotton and wheat, but compete with them on cultivated area. The numbers of cattle and sheep have been somewhat stable during the period 2001–2005 (table 7.3), but this does not mean that there would not be changes in forage production and pasture cropping capacity.

Pastures near villages, populated sites and water points are widely degraded because of overgrazing. The removal of vegetation for fuel and firewood, in addition to overgrazing, initiates erosion processes, including water erosion on sloping lands.

The decreasing fodder capacity of pastures and/or their complete marginalization, along with the demand for irrigated arable land for cotton and wheat, destabilizes cattle husbandry more than sheep breeding. Additional (winter) fodder is needed in all cases and, in addition, the production system should be able to adapt to and manage the common occurrence of dry years.

Technical solutions to maintain or increase pasture productivity have been recommended by different international organizations. They include common anti-erosion measures, such as restricting the access of livestock or limiting overgrazing in the most vulnerable areas, re-seeding degraded pastures and introducing new forage crop varieties and entire species. Creating socio-economic conditions conducive to cooperation and investments for sustainable pasture management are, however, even more complicated than for crop production.

The overall indicators of the degradation level of pastures reveal the magnitude of the erosion and desertification problem. More than 16.4 million ha of grazing land (73 per cent) are subject to degradation, mainly due to overgrazing and climate fluctuation. The regions most affected are reported to be the Republic of Karakalpakstan and the regions

of Navoi and Bukhara. The Research Institute for Karakul Sheep Breeding and Desert Ecology located in Samarkand indicates that 40 per cent of desert pastures suffer from degradation, particularly those in the Kyzyl Kum Desert (44 per cent). The Institute suggests that desert pasture management would be a viable alternative for pasture protection and rehabilitation. Bioremediation (phytomelioration) by increasing land cover and favouring productive species, including the introduction of exotic ones, can be used for both protective purposes and in order to increase productivity. In organizational terms, pasture protection and rehabilitation would require timely grazing restrictions and a solution to the problem of excessive pressure around water points.

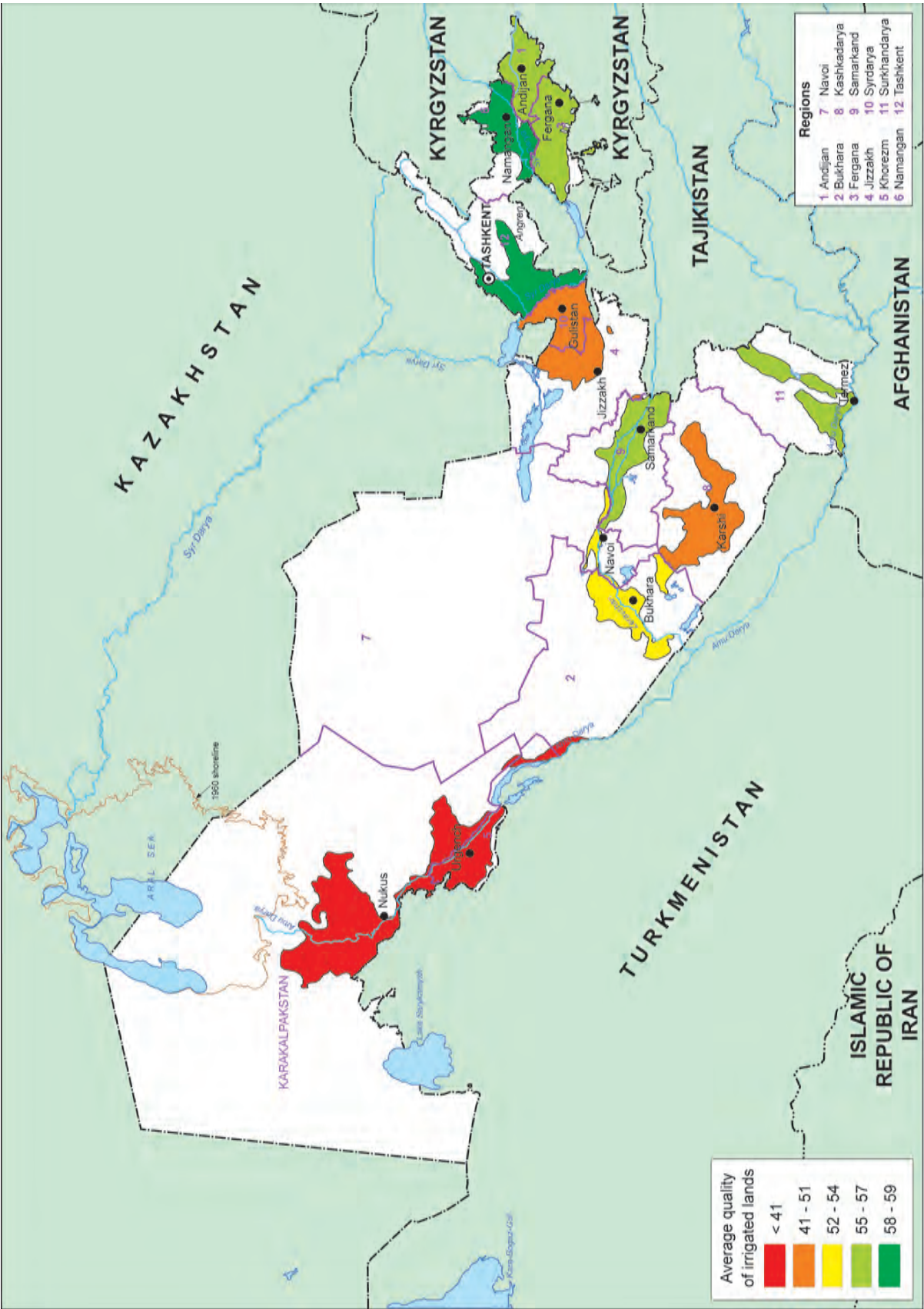
Karakul sheep have a special place in livestock breeding because of their ability to survive in extreme arid conditions. From its genetic centre of origin in Bukhara, the breed has been adopted for production in more than 50 countries. The sheep population in Uzbekistan is 4.5 million, with more than half of them being reared in large cooperatives. Year-round herding takes place in sa

7.7 Degraded agricultural land

The ZEF/UNESCO Project on Sustainable Management of Land and Water Resources in Khorezm provides scientific evidence on tree species and growing techniques enabling the production of fuel wood, leaf fodder and fruit on former croplands that have been abandoned because of salinization and/or waterlogging. Bearing this in mind, and noting similar experiences in other parts of the world, research, experiments and pilot projects should be further encouraged. In addition to production, requirements such as erosion control for riverbanks and mountain slopes could justify the use of woody species.

Given the scarcity of resources in the farming communities and the need for revenue in the short

Map 7.1: Irrigated land salinity levels



Source: Environmental Profile of Uzbekistan 2008 Based on Indicators, United Nations Development Programme, 2008.
Note: The boundaries and names shown on this map do not imply official endorsement or acceptance by the United Nations.

Box 7.1: Promising results of agricultural research on decreasing economic losses suffered by farmers or pastoralists as a result of climate change

According to field research in Khorezm and Jizzakh, by using laser-guided land-levelling, 15–20 per cent less water is needed during leaching and irrigation. Water user associations might identify the provision and renting of the required equipment as an additional activity.

Research in the Jizzakh region and Pakhtakor has shown that raised-bed planting of wheat and rice improves both the yield (6.0 to 6.5 t/ha and up to 14.2 per cent, respectively) and water productivity (from 1.23 t/1,000 m³ to 1.32 t/1,000 m³). At the same time, the average seed rate is reduced by 100 kg of seed/ha.

Intercropping often provides better income and improves soil quality at the same time. Intercropping maize and mung beans, for instance, improved the net profit of farmers in Pakhtakor by 550 US\$/ha, while intercropping cotton and mung beans increased the net profit by 650–850 US\$/ha.

Water-efficient, drought-tolerant and salinity-tolerant crops such as sorghum, pearl millet, barley, triticale or liquorice have potential as fodder crops and provide good income opportunities for farmers, for instance in the Kyzyl Kum region, also in times of climate change, while simultaneously improving soil quality.

Research in the Kenimeh district (Navoi region) identified key species in rangeland rehabilitation such as *Haloxylon aphyllum*, *Kochia scoparia*, *Eurotia eversmanniana* and different combinations of *Salsola*, *Agropyron* and *Atriplex* to prevent food shortages for Karakul sheep in the course of climate change.

term, undertakings of this kind, requiring a longer payback time, should be supported by public funding and/or affordable credits. In order to widen the scale of the rehabilitation and use of marginalized lands, a support infrastructure in terms of training and the provision of technology and plant material should be in place. Equally importantly, with regard to longer term investments for productive and/or protective purposes, the socio-economic conditions and public authority policies must allow sufficient overall security in terms of future benefits, including land tenure or land-use rights.

7.8 Climate change as a challenge for sustainable agriculture

Uzbekistan is highly vulnerable to climate change given that agriculture is a key factor concerning GDP and even more so with regard to employment and social stability.

As Uzbekistan's agricultural activities in irrigated areas depend on transboundary rivers by 90 per cent, the effects of climate change must be seen within the perspective of the entire Central Asian region. Predictions suggest that summers will be warmer. The mean annual temperature throughout Central Asia is expected to increase by from 3°C to 4°C up to 2080–2099. Such temperature increases will change the hydrological cycle, particularly streamflow seasonality and regional water availability (chapter 9).

The temperature during the winter wheat harvest in mid-June increasingly exceeds 40°C, leading to severe yield losses and unfavourable milling properties. Increased evaporation during the growing season will further reduce the production of spring wheat by 27 per cent or more. An increase in the total number of days with temperatures above 40°C is likely to prove unfavourable also for melon and watermelon crops and to decrease cotton yields by 10–40 per cent.

An increased frequency of heavy rainstorms will increase runoff and soil erosion. This is of particular concern in areas with an annual rainfall between 500 and 750 mm and where there is insufficient ground cover.

The productivity of rangeland is also adversely affected by climate change in the non-mountainous arid areas with desert vegetation, in the semi-arid regions currently used for summer grazing, and in the sub-humid areas. It is expected that the composition of plant communities in the rangeland used for pasture will be significantly altered, with consequences for forage production, cattle breeding and the rearing of Karakul sheep. The seasonal timing of rainfall is reported to influence animal live weight and survival to the end of the year, thus requiring different management strategies. According to the Second National Communication by Uzbekistan under the UNFCCC, negative impacts are expected on the reproductive capacities of Karakul sheep

due to a 5–11 per cent increase in thermal loads by September 2030.

Early action to adapt Uzbekistan's agricultural practices to these negative effects of climate change and targeted strategies towards the further processing of agricultural crops are highly desirable for GDP, food security, employment and environmental issues. The Communication states that the cost of taking no action would be considerably high. By 2050, cotton crop losses caused by the lack of irrigation water could reach 11–13 per cent in the Syr Darya River basin and 13–23 per cent in the Amu Darya River basin as a result of increased evaporation and reduced flow caused by climate change. It is also pointed out that a number of adverse factors could lead to a 10–15 per cent decrease in agricultural production by 2050 in comparison with the current period.

This illustrates the need for both changes in the agricultural sector and government awareness that measures must be taken if agriculture is to remain one of the main components of GDP and social stability.

With regard to agriculture, Uzbekistan has two important assets to help it cope with the challenges set by climate change. First, the country has always been a hotspot of agricultural plant biodiversity and has successfully kept a high number of varieties over decades. It has a total of 124 agricultural crop species and 952 varieties/hybrids, for example, 39 species and 389 varieties of vegetable crops and melons; 22 species and 204 varieties of fruit and berry crops; 5 species and 52 varieties of industrial crops; and 14 species and 129 varieties of grain crops. Second, Uzbekistan has a long tradition of agricultural research of a very high standard. Specifically, in this decade a lot of promising research findings have been published on climate change adaptation (box 7.1). There are numerous research sites in

Uzbekistan, for example, the Uzbek Cotton Research Institute, the Uzbek Soil Science Institute, the Central Asian Research Institute for Irrigation (SANIIRI), the Uzbek Research Institute for Karakul Sheep Breeding and Desert Ecology, Tashkent Institute for Irrigation and Melioration, Andijan University and the ZEF/UNESCO Khorezm project at Urgench State University.

In times of accelerating climate change impacts, adaptation measures will need to improve agricultural methods and the variety of crops grown, including methods for sustainable cotton cultivation. When looking at the water footprint of the different components of the cotton value chain and the predicted water scarcity in the near future, the decision of the Government of Uzbekistan to reduce the area of cotton plantations by 10 per cent is definitely regarded as the way forward. There is room to intensify simultaneously a targeted strategy for further processing cotton in order to increase the profit per hectare of cotton.

Under the ZEF/UNESCO Khorezm project, a value chain analysis showed that, with the involvement of local textile enterprises in processing cotton fibre into cotton yarn, the same regional export revenue could be achieved while reducing by 30,000 ha the area sown with cotton (roughly 27 per cent of the current area) (table 7.4). For an area of 110,000 ha, 228 million m³ of irrigation water could be saved annually, as well as about US\$ 6 million in subsidies.

Owing to the large area of arable land under cotton cultivation, the problems related to the commonly used cotton–wheat rotation and the large amount of irrigation water required by the crop, there is a need to extend the study to a larger area, involving the economic actors in cotton processing and refinement with the aim of generating more domestic income

Table 7.4: How the cotton value chain can generate more income at a lower price

	Required raw cotton, thousand tons	Required cotton area, thousand ha	Reduction in cotton area, %	Irrigation water on field level, mill. m³	Explicit subsidies to agriculture, US\$ million
Baseline (2005)	287	110	0	824	20
100% fibre export	239	92	17	688	17
Increased ginning efficiency	219	84	23	631	16
Yarn export	207	79	28	596	14
Fabrics export	173	67	39	499	12
T-shirt export	89	34	69	257	6

Source: Science Brief (ZUR) No. 2, ZEF/UNESCO Rivojlanishlari, May 2008.

and simultaneously reducing the stress on the environment and natural resources use.

7.9 Land reform and agrarian policy

Land reform started in 1998, with the Ministry of Agriculture and Water Management leading its implementation (See the first EPR of Uzbekistan). The main aim of the land reform is to increase agricultural productivity. Except for restructuring farm surroundings, the land reform is more focused on enterprises, buildings and movables.

Rural land

Since 2001, the situation of farm structures and the organization of production and production units have undergone significant changes. By then, the large agricultural cooperatives (shirkats, formed on the basis of the former kolkhozes/sovhozes) had been largely abolished and divided into farms. Only Karakul sheep breeding is still organized to a great extent in big units, and in the regions in question shirkats still exist – more than 100 of them. A third category, dekhans (small family farms), have maintained their position and still represent an efficient and secure form of agricultural production, although they are located on very small plots. A more recent policy is to amalgamate farms in order to form bigger production units (Farm Optimization Programme). The implementation of this Programme resulted in a decrease in the number of farms from 216,000 at the beginning of 2008 to 105,000 at the end of 2008.

Although state involvement and direct intervention in agrarian production have been and remain very strong, it is evident that the change in farm structures has affected decision-making and the use of resources, particularly land and water. Accordingly, all efforts to improve the sustainability of water and land use must adapt to the changed and changing situation in which a slow transformation, rather than reform, of agricultural systems has led to greater possibilities for farm-level decision-making.

New and important stakeholders have emerged: water user associations (WUAs). Although their functions have not yet been defined by a specific law, WUAs play a central role in local decision-making (chapter 6). One important aspect of WUAs is that they not only influence the sharing of critical water resources, but, together with the farmers, they are instrumental

in maintaining and improving the farm-level irrigation infrastructure.

The ongoing National Programme on the Development of Irrigation addresses the main channels and pump stations. Planners and developers should match these huge investments in a functional way at the community and farm level of water distribution. The fully state-funded programme should be accompanied with organizational, financial and technical support for farmers and their organizations. Sufficient capacity-building, including improvements in water economy and environmental management, would also be needed. With regard to the rehabilitation of severely degraded land, investments by farmers to improve land management in the longer term would require increasing security in terms of land tenure and/or land-use rights. In insecure circumstances, short-term needs, particularly regarding water and energy, dominate decision-making and take priority over maintaining the resource base in the long term.

The production of cotton and wheat on irrigated land is firmly regulated, with market-based decision-making not having a significant role for producers; however, the State determines their prices and production targets according to the world market.

However, owing to other decisions already made in regulating agricultural production, the degree of market orientation has, to some extent, increased. There has been a greater opportunity to develop – alongside state regulation – commercial production under a completely different set of rules. With the “...optimization of areas under cultivation...” and the decision concerning the total area under cotton cultivation, a greater opening for market orientation could be developed. Such a development could also be highly relevant to the environmental performance of the farms and farming communities.

Dekhans are the prevailing form of production and increase overall security by producing food staples. They compete with the other two forms of farming for the same critical land and water resources, and should be addressed in the development of the agricultural extension services and other support measures.

Urban land

In line with a Cabinet of Ministers decision, only foreign embassies, or their representatives, can

privately own land. Several hundred shops were auctioned as real property, together with the transferable ownership right to the underlying land, but the process was not continued. In addition, land-use rights were strictly regulated as in the Soviet era when the usage of specific parcels could not be changed.

As for dekhkan farms, urban land-use rights are lifelong and inheritable. Two additional forms of tenure are the right to permanent use and the right to leases. Permanent use is a common form of land-use right found in other Eastern Europe, Caucasus and Central Asian countries. Unlike a lease, the permanent use right is of indefinite duration and is directly linked to the use of the parcel. Termination of the designated type of use also terminates the right. Leases are, of course, of limited and established duration. The division of buildings and land is also applied in urban areas, with one result being that buildings may be owned, but the land possessory rights are leased. Takings never compensate for the loss of land-use rights, only the loss of the structure upon the land. Individual apartments may be owned, as can the building, but the land remains under government ownership.

While cities and other urban centres account for only 0.5 per cent of the total land area of Uzbekistan, it is difficult to overestimate the importance of this land. Urban land use is regulated by the Land and Town Planning Codes, as well as laws relating to the government land cadastre and environmental protection. However, these regulations make virtually no mention of the role of the State Committee on Land Resources, Geodesy, Cartography and State Cadastre in managing urban land use. The country does not have a separate service managing urban land resources; instead, these functions are carried out by various ministries and other authorities. A major shortcoming in the management of urban land use is the lack of a systematic cadastral land information system. Problems with the existing cadastre include the lack of an established methodology for surveying urban land. This is hindering the development of a real estate market, and also makes it difficult to calculate the rates of payments for land (for example, land taxes and rates for leases). Another problem is the lack of a system for determining the efficiency of utilization of land in urban areas.

Obstacles to an ownership market

Given that Government policy is that the private ownership of land remains with the State, obstacles to the creation of a housing market could be removed to allow the market structure rights to lease. In general, the legal framework is not yet ready for real estate, for example, land property, the implications for systematic recording, economic implications, mortgages, and so on, have not yet developed satisfactorily.

Agricultural land-use rights do not allow access to credit, and the entire agricultural sector is still tightly controlled and managed by the Government. Privatization could not be seen as valid. Agricultural land use cannot be effective in a situation where new ideas and products can be freely explored and virtually no long-term investments are made.

Deepening the land reform by stipulating that farmers must return the land in a better condition than when it was received has been seriously discussed and may be implemented. The monitoring of land use and quality, which should be conducted every five years, can be used to terminate lease rights if the land is deteriorating.

7.10 Protected natural areas network

The 1998 National Biodiversity Strategy and Action Plan identify five bio-geographical zones:

- Desert ecosystems of lowlands and plains;
- Piedmont semi-desert and steppe;
- Riverine ecosystems in, and peripheral to, major rivers;
- Wetland and delta ecosystems;
- Mountain ecosystems.

The protected natural areas network is one of the three strategic areas of the National Biodiversity Strategy and Action Plan, covering the development of institutional and legal frameworks, the expansion of the protected natural areas network, the management of protected natural areas, national biodiversity information systems, captive breeding and ex-situ conservation. Uzbekistan aims to establish an ecologically stable network of protected natural areas, which will represent all ecosystems and whose coverage will be a minimum of 10 per cent

of the total land area. The size, non-fragmentation and representativeness of the protected natural areas network are key factors in fulfilling the aim of biodiversity conservation. Other important factors include the capacity to implement management plans and to cope with climate uncertainties and long-range impacts on the protected natural areas.

Uzbekistan's current protected natural areas fall into five categories: nature reserves/national reserves (zapovedniks); national parks; one ecological centre; wildlife areas (zakazniks); and national nature memorials. The latest significant expansion of the network was the designation of the Aydar Arnasay Lakes System as a wetland of international importance under the Ramsar Convention on Wetlands of International Importance Especially as Waterfowl Habitat. Aydar Arnasay (527,100 ha) is an ornithological protected area and the largest water body of Uzbekistan, consisting of lakes in the middle stream of the Syr Darya River with an increasing mineralization of water with a current level from 8 to 10 g/l. With this enlargement, the total area of protected natural areas accounts for 5.8 per cent of the country's territory. In addition, the 16 protected natural areas, which have been established to protect underground freshwater generation zones (350,919 ha), and the protection zones of the rivers (land area 27,900 ha) have also other ecological functions and help biodiversity conservation to a certain extent.

Despite the progress made in extending the protected natural areas network in Uzbekistan, the representativeness of the network and inclusion of new protected sites should be further addressed, as also stated in the National Biodiversity Strategy and Action Plan. The diversity of flora and fauna directly depends upon the state of natural habitats, which have undergone great changes over decades. This has resulted in a reduced number of species, and, in some cases, the danger of extinction threatens a growing number of species.

7.11 Forest land

Among the 8.8 million ha of Uzbek forest land, about 3.4 million ha are covered with forests, namely 7.5 per cent of the national territory, and 0.9 million ha with other wooded land. All forests are owned by the State. Forest protection, conservation and utilization and forest plantations are supervised by the Cabinet of Ministers, the Forestry Management Department of the Ministry of Agriculture and Water Management,

as well as local authorities and state bodies. The Forestry Management Department is responsible for forest management at the regional level through its seven regional forestry centres.

The main function of Uzbek forests, which grow in arid continental climate conditions, is to provide protective services, for example, watershed protection, wind and dust shelter belts, biodiversity and wildlife conservation. Wood is harvested by the local population for fuel and construction, whereas industrial uses are very limited. Non-wood forest products and services provide a major contribution to livelihoods in rural areas, for example, the collection of nuts, fruit, berries, mushrooms and medicinal plants, hunting, grazing and beekeeping. Forest degradation, desertification and soil erosion in mountainous areas are major concerns, which are often caused or worsened by socio-economic problems and poverty. High priority has been given to combating the anthropogenic activities responsible for such damage, such as illegal logging, overgrazing and the damaging collection of plants. Reducing game damage, fires, pests and diseases is another challenge. The Forestry Management Department is carrying out afforestation activities of about 42,000 ha annually. Nature reserves have been created for biodiversity and wildlife protection purposes.

The National Forest Programme was launched in 2006 with the objective of enhancing long-term sustainable forest management that benefits local communities. It aims at developing institutional capacities for carrying out inventories, assessments and monitoring of forest resources; promoting the sustainable use of wood; raising public awareness on forestry issues; enhancing public participation in forest management; and strengthening forest education and training.

7.12 Conclusions and recommendations

Agriculture plays a pivotal role in rural development in Uzbekistan. The implementation of sustainable agricultural production would benefit from an encouraging environment, including policies for the sustainable and efficient use of natural resources following the latest farming system reforms. If joint efforts are made, sustainable agriculture can be achieved under the present outlook and will contribute to preparing farmers to cope with the immediate future challenges caused by the impact of climate change and the expected increase in competition for land and water resources.

Recommendation 6.1 in the chapter on sustainable water management addresses the urgency of implementing water-saving plans for irrigation. This is justified not only for water saving, but also in the context of seeking sustainability in a wider context of land and water resources management. The observation on the need to address the compatibility of state-driven investments in irrigation systems and the community and farm level irrigation infrastructure, likewise, concerns the whole production system. Individual farmers and WUAs are in great need of training and technical support, including information on and encouragement to use water-saving and soil conservation farming techniques.

In particular, agricultural extension and other support services for farmers have shown worldwide their immense value for transferring knowledge to the farming population, particularly in the field of the sustainable use of natural resources. In turn, this will contribute to efficient farm enterprise development. Furthermore, the farming population would benefit from increased links to domestic and international markets and trade, which can be achieved through greater involvement of the private and public trade sectors. The extension services could be flanked with permits and by actively promoting training and demonstration projects on methods such as land-levelling, direct sowing, the preservation of crop residues in the fields and mulching; crop rotation and intercropping should also be encouraged as additional means for soil protection and maintaining fertility.

Recommendation 7.1:

The Ministry of Agriculture and Water Management should consider promoting the use of agricultural conservation tools for saving water and protecting soil on irrigated croplands, which could be supported with training and demonstration projects.

Many of the recommendations of the 2001 EPR address the use of market economic mechanisms as a means to provide incentives to improve land management and the rational use of natural resources. The observations concerning land and water management in the present EPR support the view that market-based or other economic instruments are not widely used or developed to improve environmental performance in the agricultural sector. The level of direct state intervention in the production of cotton and wheat has remained high, and there are no pricing incentives in the use of basic resources, particularly water.

At the same time, some observers speak on behalf of increased economy-based decision-making at the farm level, and the possibility of improving the economy, which, at best, would be conducive to the longer term planning of resources management and sustainability. Furthermore, some recommendations have already been made on creating new cash flows, such as seeking to rehabilitate marginalized lands, which can be achieved only through direct subsidies or income generation. Also, in dry land ecosystems, the improvement of the socio-economic situation of the population, focusing on alternative livelihoods and enhancing the multifunctional role of the ecosystem, would increase long-term sustainability. The use of public funding, for example in the form of payments for ecosystem services, could also be part of the overall package of economic incentives.

Recommendation 7.2:

The Ministry of Economy, the Ministry of Agriculture and Water Management and the local authorities should develop and implement market mechanisms and innovative economic incentives that improve the socio-economic condition of the rural population and, at the same time, are conducive to improving land and water management.

Various authorities in Uzbekistan have responsibilities in the management of protected natural areas. Both the representativeness and adequacy of the protected natural areas network, as well as its management, need to be further addressed. A prerequisite to ensure the sustainable conservation and protection of rare and endangered species and habitats is to create sufficiently large and non-fragmented protected natural areas, encompassing all natural ecosystems.

Recommendation 7.3:

The State Committee for Nature Protection should establish an integrated network of protected natural areas, strengthening the monitoring of biological diversity, and prepare the necessary legal and institutional decisions to extend and complete the current network.

In view of the expected significant changes and threats related to agriculture and climate change, the available means for adaptation and managing uncertainties must be addressed, including the management of transboundary waters, adapting water-wise technologies for increased water productivity by the genetic enhancement of cultivars, and integrated crop–livestock management.

Additionally, land management planning may be of relevance for mitigation purposes, for example, carbon sequestration by afforestation in rangeland and degraded sloped areas, and by adding soil organic matter for improved soil management (conservation agriculture).

Recommendation 7.4:

The Ministry of Agriculture and Water Management, in cooperation with the State Committee on Land Resources, Geodesy, Cartography and State Cadastre and the Centre of Hydrometeorological Service (Uzhydromet), should address rain-fed and irrigated land in policy documents on climate change adaptation.

Only 0.5 per cent of the total land area of Uzbekistan is urban land. Although it is difficult to estimate the importance of this land, the country does not have a separate service managing urban land resources; instead these functions are carried out by various bodies. A major shortcoming in the management of urban land use is the lack of a systematic cadastral land information system. Problems with the existing cadastre include the lack of an established methodology for surveying urban land.

Recommendation 7.5:

The Cabinet of Ministers should implement the cadastral land information system of urban land in such a way as to plan and manage urban land use.

Chapter 8

ENERGY AND THE ENVIRONMENT

8.1 Developments since the first Environmental Performance Review in 2001

The importance of environmental protection and the rational use of natural resources was formally recognized in the 1997 Law on the Rational Use of Energy. The Law was amended in 2003, when an energy system of certification for national production was introduced. This recognition is important because traditionally the strategy underlying the development of Uzbekistan's energy sector did not pay particular attention to environmental protection. Instead, for a long time the strategy was based on three principal objectives: securing the energy independence of the country, improving the rural population's access to natural gas and ensuring low-cost energy for the domestic market, in order to strengthen the comparative advantages for industry, agriculture and social welfare. Uzbekistan's development policy has traditionally aimed towards import substitution, and energy policy remains an essential factor of this policy. Low-cost energy has allowed the development not only of the petrochemical industry, but also the metallurgical industry and processing industries. It also enabled the maintenance of large-scale irrigated agriculture (cotton) that largely depends on the long-distance transfer of water (table 8.1).

The Law is largely declarative, without any real means of implementation or being directly related to the process of integrating Uzbekistan into the world energy market. After independence, Uzbekistan, being a doubly landlocked country and completely dependent on the Russian Federation's transit network, sought to promote its interests by adhering to the Energy Charter and subsequently the Energy Charter Treaty in 1995, as well as the Energy Charter Protocol on Energy Efficiency and Related Environmental Aspects. Building on the provisions of the Treaty, the Protocol requires its participating States to formulate clear policy aims for improving energy efficiency and reducing the energy cycle's negative environmental impact.

In 2000, Uzbekistan's energy intensity (primary energy consumption per unit of gross domestic product – GDP) was about 4 times higher than the energy intensity of China, and the Government once again sought to reinforce its action as regards energy efficiency.

In accordance with the Law on the Rational Use of Energy, in 2002 the Cabinet of Ministers adopted the Programme on Energy Efficiency until 2010. The main objectives of the Programme are to: (i) prioritize energy conservation issues and develop appropriate policies to address them; (ii) improve the efficiency of energy resources use and promote energy conservation; (iii) reduce energy intensity in the industrial sector; and (iv) promote the development of a market-oriented energy sector. Among the measures referred to in the Programme, it is worth mentioning the measures without cost implications of an organizational and educational character aimed at improving the use of energy resources, with potential savings estimated at 5 per cent of GDP.

The 2002 Programme on Energy Efficiency does not fully integrate environmental concerns and energy efficiency. Although it is still difficult to speak about a comprehensive and coherent programme in terms of environmental protection, the Programme provides a first estimation for each sector: Uzbekneftegaz: 1,148 toe; Uzbekenergo: 324 toe; industry: 1,882 toe; agriculture: 403 toe; consumption goods and commerce: 93 toe; communal services, construction and transport: 125 toe; local authorities (khokimiyats): 6,067 toe.

If the 2002 Programme was monitored, the results are yet to be communicated. No reference is made to it in official or presidential documents. The draft of the provisional law on electrical energy prepared in 2007, and including energy efficiency, refers to the 2001 Presidential Decree on the Reinforcement of Economic Reforms in the Energy Field.

Table 8.1: Energy balance, 2006

Supply and consumption	Coal and peat	Crude oil	Petroleum products	Gas	Hydro	Electricity	Heat	Total ^a
Production	1,094	5,578	..	50,950	545	..	..	58,167
Imports	10	4	..	893	..	984	..	1,892
Exports	-11	..	-304	-10,273	..	-991	..	-11,579
International Marine bunkers ^b	..	..	..	..	..	..	..	..
Stock changes	-26	..	..	..	..	..	..	-26
TPES	1,068	5,582	-304	41,571	545	-7	..	48,454
Transfers	0	-23	25	..	..	..	..	2
Statistical differences	..	..	..	..	..	..	..	..
Electricity plants	-468	..	-483	-5,003	-545	2,529	0	-3,969
CHP plants	-403	..	-614	-5,115	..	1,711	1,313	-3,109
Heat plants	-1	..	-217	-1,428	..	..	1,261	-385
Gas works	..	..	..	..	..	..	..	..
Petroleum refineries	..	-5,403	5,288	..	..	..	..	-115
Coal transformation	..	..	..	..	..	..	..	..
Liquefaction plants	..	..	..	..	..	..	..	..
Other transformation	..	..	..	..	..	..	..	..
Own use	-1	-8	-218	-1,816	..	-362	..	-2,406
Distribution losses	-10	-62	..	-1,589	..	-373	..	-2,035
TFC	184	85	3,477	26,620	..	3,497	2,574	36,437
Industry sector	51	..	232	6,310	..	1,340	..	7,933
Transport sector	0	..	1,843	1,387	..	115	..	3,345
Other sectors	132	..	926	17,292	..	2,042	2,574	22,967
Residential	14	..	19	14,283	..	635	..	14,951
Commercial and public services	..	..	..	2,857	..	271	..	3,128
Agriculture and forestry	3	..	712	153	..	1,137	..	2,005
Fishing	..	..	..	..	..	..	..	..
Non-specified	115	..	195	..	..	..	2,574	2,884
Non-energy use	..	85	476	1,631	..	..	..	2,192
of which:								
Petrochemical feedstocks	..	..	..	..	..	..	..	..

Source: International Energy Agency, 2009.

Notes: a Totals have been rounded up and may not add up.

b International Marine bunkers are not subtracted from the total primary energy supply for world totals.

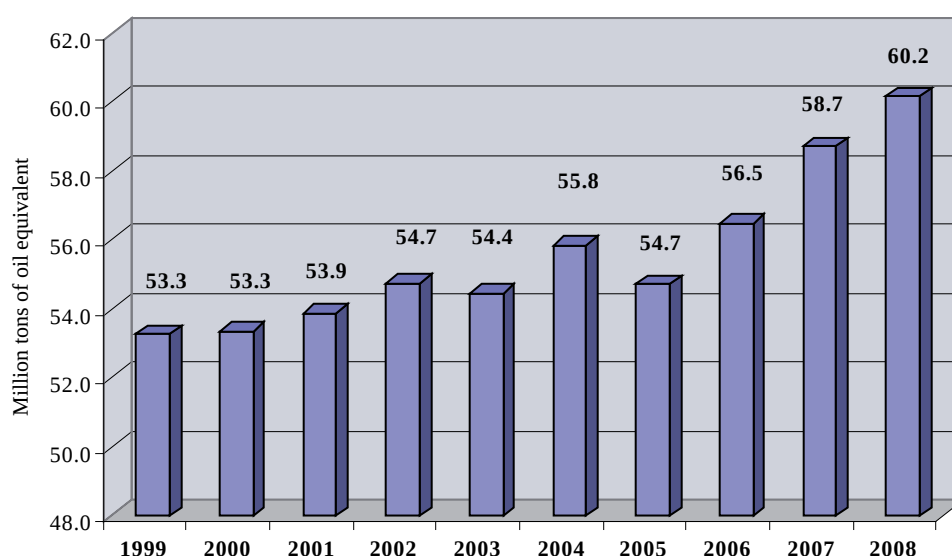
In addition, the 2002 Programme does not refer to an institution or organization specifically responsible for its implementation. As mentioned in the 2002 Programme, it is estimated that more than 2.6 trillion sum, which is a huge amount, was the required investment for 2002 and 2003, thus illustrating that the described objectives require the mobilization of resources not only of the relevant institutions, but also of the State, private investors and the international community.

The progressive installation of meters in various sectors of the economy forms the first concrete and positive steps to implement the Programme. According to the authorities, meters will be installed for 85 per cent of the population and will relate to

water and heating. It is quite difficult to give an indication of the degree of implementation of the Programme on Energy Efficiency.

Some of the objectives identified in 2003 appear in the minutes of the 13 February 2009 Cabinet of Ministers session on the Republic's socio-economic development in 2008 and the priorities for economic development in 2008–2009, notably the following:

- The approval of a development programme for the modernization of electrical energy over the period 2009–2013.
- The approval of a programme for the reduction of energy intensity and introduction of energy-saving systems.
- The introduction of automated metering systems

Figure 8.1: Total hydrocarbon production for 1999–2008, million toe

Source: Uzbekneftegaz, 2009

for electricity consumers (2009 for large-scale consumers, 2010–2012 for urban users, 2012–2015 for rural users).

Certain investments listed in the 2003 investment plan appear in the 2008 Presidential Decree on the Programme to Support Enterprises of the Proper Economy Sector, in order to Stabilize Activity and Increase Export Potential and the 2009 Presidential Resolution on the Programme of Measures for the Realization of Important Projects of Technical Modernization and Technologies for Production Equipment for the Period 2009–2014.

Testifying to a long-lasting unfavourable trend, the energy intensity of the Uzbek economy has grown from 2.8 to 4.3 tpe/gdp¹ between 1997 and 2003. The figures provided by the International Energy Agency also rank Uzbek society as the most energy-consuming economy among the former soviet countries: 0.94 tpe/gdp (PPP)² in 2006 versus an average 0.45 tpe/gdp (PPP).

Pursuant to the Government Reform Programme providing for a step-by-step conversion of the Uzbek energy sector to a functionally unbundled and partially privatized sector in five years (Cabinet of Ministers Resolution No. 290 of 21.06.2004), two bodies were established: Uzbekenergo and Uzgosenergonadzor.

Uzbekenergo (state joint stock company) replaced the abolished Ministry of Energy. It inherited the functions of the Ministry in operating the assets and government property held in trust, as well as the Ministry's responsibilities. In 2005, Uzbekenergo converted all thermal power and combined heat and power stations and regional distributors to joint stock companies. Hydropower stations, UzElectroSet (a main electric grid company) and UzEnergoSbyt (company that liaises between electricity and heat generators and distributors) were not converted to joint stock companies and remained state property. Thirteen unitary electricity generators, three heat generators, one unitary electricity transmission company, and fifteen regional distribution companies have been established, among others.

Uzgosenergonadzor, the state agency responsible for monitoring the electric power sector under the Cabinet of Ministers, initially established as the government regulator for the electric and thermal energy industries and coal mining, has been converted into the Uzgosenergonadzor state inspectorate, which issues power production licences at stationary power plants and controls electricity, coal and heat under the authority of the Cabinet of Ministers.

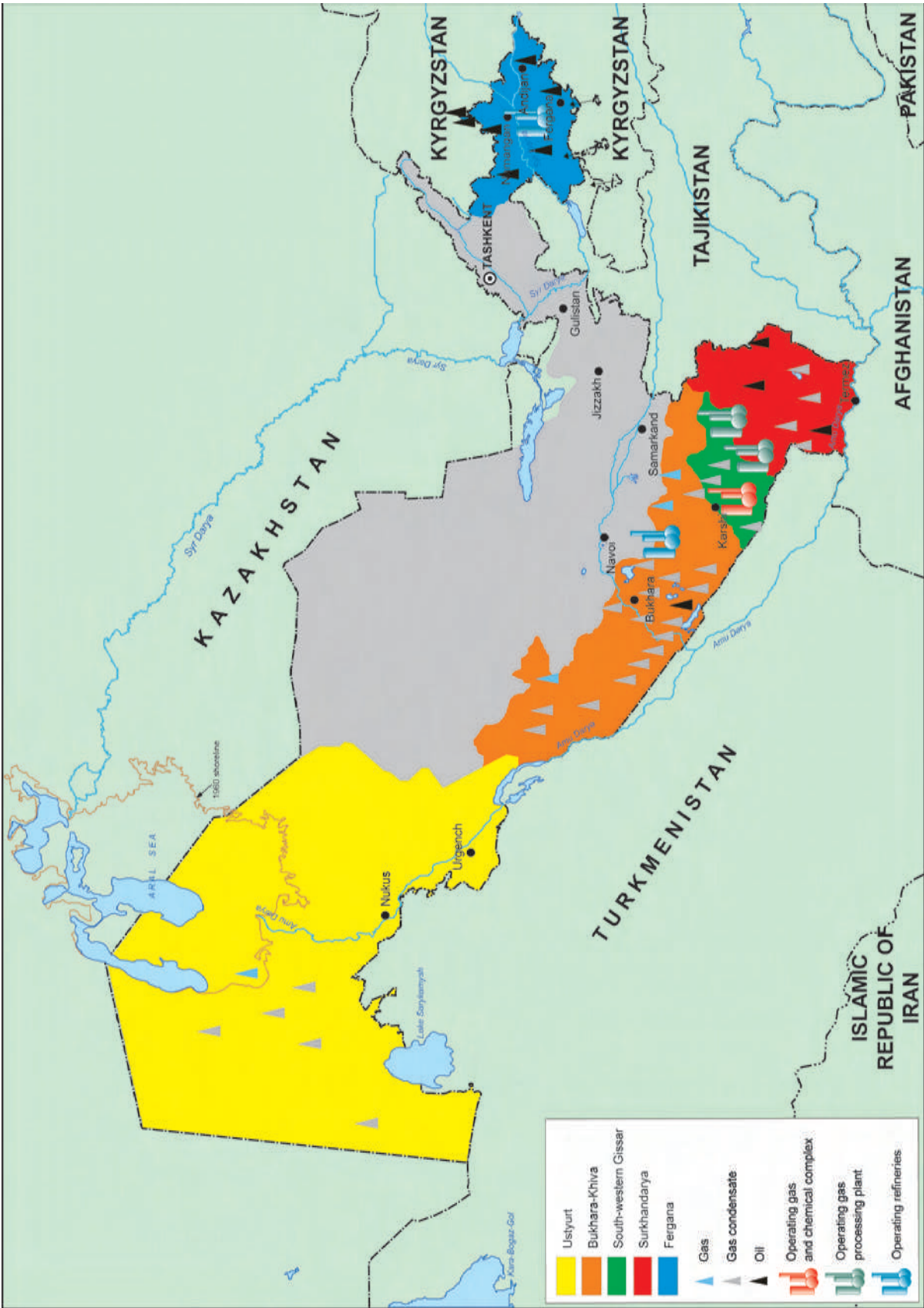
8.2 Production

The revival of the development of the important energy reserves of Uzbekistan is relatively recent and is actually related to a new climate that is more favourable to new investments, particularly foreign investments.

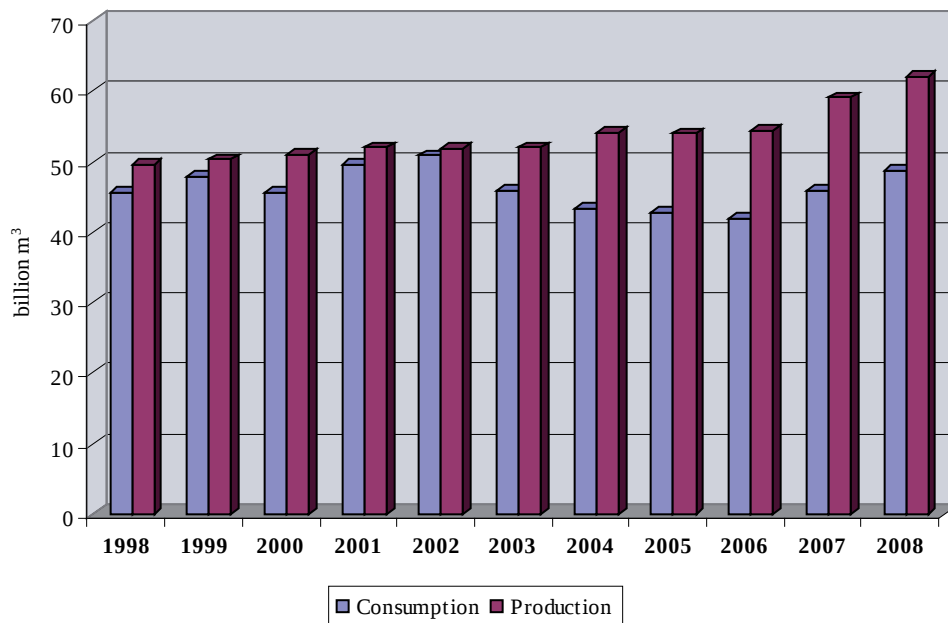
¹ tpe/gdp = toe/thousand 2000 US\$.

² tpe/gdp (PPP) = toe/thousand 2000 US\$ PPP.

Map 8.1: Oil and gas extraction and processing



Source: Uzbekneftegaz, 2009.
Note: The boundaries and names shown on this map do not imply official endorsement or acceptance by the United Nations.

Figure 8.2: Natural gas production and consumption for 1998–2008, billion m³

Source: Statistical Review of World Energy 2009, British Petroleum.

According to the Concept of Geological Surveying for Oil and Gas for 2005–2010 produced by Uzbekneftegaz, a national holding company, proven hydrocarbon reserves are likely to increase by 364.77 million toe during the period. It is expected that more than half of this growth in reserves (54 per cent) will be from the natural gas deposits in the Ustyurt region (figure 8.1).

Deep drilling at 144 promising sites is foreseen for 2005–2010. Of these, 74 will be located in the Bukhara-Khiva area, and 34 in the Ustyurt region. The remaining sites will be in the Fergana, Surkhandarya and Gissar Valleys (map 8.1).

Coal

Ugol (a joint stock company) is the exclusive manufacturer of coal in the country and comprises five coal mining companies. Three coal mining technologies are used at the Angren coal field (Tashkent region): open-pit mining at the Angren strip mine; underground mining at Mine No. 9; and underground coal gasification at the Podzemgaz installation. Two other coal mining companies, located in the Surkhandarya region, use the underground mining method. Since independence, coal production and consumption have decreased significantly in Uzbekistan.

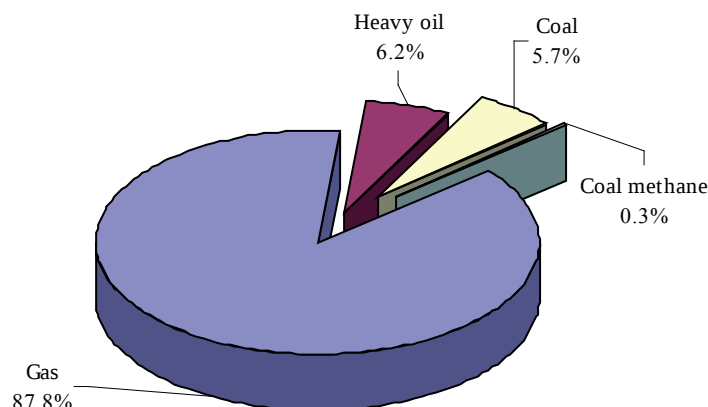
Current coal reserves in Uzbekistan are estimated at 1.9 billion tons, with about 80 per cent of these being brown coal (lignite). Coal mining is conducted in three deposits: Angren, where about 80 per cent of all coal is extracted, Shargun and Baysun. All extracted coal is consumed in the country. Uzbekenergo power plants are Uzbekistan's biggest coal consumers, consuming 80 per cent of the country's coal output and 100 per cent of the gas from underground coal gasification.

Oil

Uzbekistan is a net oil importer, with production from its estimated 600 million barrels of reserves expected to continue to decline slowly. The fields are mostly near exhaustion; hence the decline in production since the late 1990s, after an initial spurt in the post-soviet period made the country temporarily self-sufficient. Oil production is about 120,000 bbl/day, half of which is crude, the other half being condensate.

Gas

With regard to gas reserves, Uzbekistan is ranked seventeenth in the world. Most gas fields are in the Bukhara and Kashkadarya regions and the Ustyurt Plateau, in the west of the Republic of Karakalpakstan. The Ustyurt Plateau is considered

Figure 8.3: Fuel consumption at thermal power plants, 2008

Source: Uzbekenergo, 2009.

the most promising area for development and remains to be fully explored, with possible reserves estimated at 1,685 trillion m³, nearly as much as the whole country's proven reserves (chapter 9) (figure 8.2).

Owing to the high sulphur content of the natural gas used in the fuel industry, which affects the lifetime of pipes, losses (estimated at 25 per cent) in transportation and distribution remain relatively high, far higher than in efficient systems, where they are commonly only 2 per cent. According to the assessment of local experts, these losses are caused by both a technically outdated and old pipeline system and a lack of coordination among energy sector companies. However, implementing energy efficiency measures inside the industry planned for the period 2005–2010 will require investments of US\$ 650 million. This should reduce the natural gas consumption required for its own needs in production, refining and transportation to 4.7 billion m³/year.

Uranium

According to the State Committee on Geology and Mineral Resources, 27 uranium deposits in the Central Kyzyl Kum, with an estimated 55,000 tons of uranium, form the core of the country's uranium mining industry. Uzbekistan has the world's seventh biggest uranium reserves. Recently, Navoi Mining and Metallurgy Plant (NMMP) commissioned the major new Northern Kanimekh uranium mine in the Central Kyzyl Kum. Commercial production there, as well as pilot production at the new Yarkuduk and

Alendy fields, should boost Navoi's uranium output by 30 per cent in 2009.

North Kanimekh is one of the most significant uranium industry sites to have been commissioned in Uzbekistan in recent years. The first stage of the mine cost approximately US \$34 million, which the NMMP funded itself. Drilling and well construction began mid-2007. The first stage is expected to achieve full capacity by 2012.

The NMMP produced 2,350 tons of uranium in 2007, up slightly from 2,301 tons in 2006. It plans to invest US\$ 165 million in development in the period 2007–2012 with a view to boosting uranium production and exports by 50 per cent compared with 2006. The NMMP produced 3,000–3,500 tons of low-enriched uranium per year in the mid-1980s. Production fell as low as 1,700 tons in 1996, when the situation in the world uranium market deteriorated. The NMMP is still technically able to produce more than 3,000 tons/year.

The NMMP is the major uranium company in Uzbekistan and controls three mining divisions that produce uranium by the in situ leach method and processes the ore at the No.1 Hydrometallurgical Plant in the City of Navoi.

There are 11 large thermal power plants (9,870 MW of installed capacity) and 31 hydropower stations (1,700 MW of installed capacity), with a cumulative installed capacity of 11,570 MW. The main part (97



Kashkadarya region. Domestic photoelectric station in Gissar reserve

per cent) of power generation comes from stations owned by Uzbekenergo, whose plants' total installed capacity is about 10,000 MW. The largest stations constitute 70 per cent of the total power station capacity.

Uzbekistan produces approximately 48,000 GWh of electricity annually. Electricity is derived primarily from conventional thermal power generation, with 77 per cent of plants powered by natural gas, 7 per cent by fuel oil and 3.5 per cent by coal. The remaining 12.5 per cent of electricity comes from hydropower (figure 8.3).

Electricity

The implementation of energy-saving technology is progressive. The construction of the Talimarjan condensation-type thermal power station started in 2005. The Investment Programme of Electricity Development and Modernization for 2009–2015 was readjusted to be a development system of the Kyoto Protocol. The Programme includes the introduction of combined cycle power stations, in particular at the thermal power stations located in Tashkent, Navoi and Talimarjan. The Programme also foresees the construction or rehabilitation of hydroelectric power stations; fifteen of those projects are retained in the priority programme described in the Presidential Decree on the Programme of Measures for the

Realization of Important Projects of Technical Modernization and Technologies for Production Equipment for the Period 2009–2014.

Renewable energy

To date, only hydroelectricity is developed and is at the heart of the Development Programme. The production of hydroelectricity decreased from 6,028 GWh in 1998 to 4,246 GWh in 2000; it found its 1998 level in 2003 only to decline again to 3,925 GWh in 2007. Hydroelectricity represents about 10 per cent of the installed electric power.

The Presidential Decree on the Programme of Measures for the Realization of Important Projects of Technical Modernization and Technologies for Production Equipment for the Period 2009–2014 envisages the realization of 15 projects in the domain of hydroelectricity for a total estimated investment of US\$ 512.9 million. The modernization of existing hydropower stations and the construction of new ones should permit Uzbekenergo to save 500 million m³ of gas or 2.3 million tons of coal.

Despite the great potential, especially for solar energy, shown by a pilot project successfully carried out by Tashkent City, at present Uzbekenergo does not plan to develop any other forms of renewable energy. At the institutional and political level, there

Table 8.2: Actual electricity consumption for 2001–2007, million kWh

User category	2001	2002	2003	2004	2005	2006	2007
Distributed quantity	37,934	38,295	37,524	37,629	36,699	39,417	40,623
of which							
Industry	15,738	16,243	16,164	15,785	15,830	16,074	15,724
Construction	130	177	128	119	130	139	108
Transport	1,226	1,211	1,181	1,305	1,353	1,300	1,254
Agriculture	11,228	11,802	11,475	11,571	9,927	10,731	9,382
Population and communal services	9,613	8,863	8,575	8,850	9,458	11,174	14,156

Source: Uzbekenergo, 2009.

are no general targets in terms of the rational use of renewable energy sources; neither are there guaranteed purchase and preferential rates on behalf of Uzbekenergo.

The State Committee for Nature Protection (SCNP), the Eco-Energy Science and Implementation Centre and the agency responsible for technology transfer have presented a preliminary concept concerning the use of renewable energy resources. The minutes of the Cabinet of Ministers session of 13 February 2009 decided that, for the first time at this level, such a programme should be formally developed. Uzbekenergo is also associated with this decision. The aforementioned Presidential Decree supporting the programme of priority projects mentions a pilot project for wind-power energy of 0.5 MVt in 2010.

Transmission

Uzbekenergo envisages the construction or restoration of power lines with the double aim of improving the integration of the Uzbek network into the regional network and reducing losses. The main forecasted works are located in the Bukhara, Fergana and Samarkand regions. Funded by the Islamic Development Bank (IDB), a 500 kV line of 218 km is currently under construction between the Syr Darya thermal power plant and the Sogdiana Substation. Once implemented, this project will cut losses by 100 million kWh in the region of Surkhandarya. In addition, the construction of a 500 kV line of 216 km from the Sogdiana Substation to the Talimardjan thermal power plant and the construction of a 500 kV line of 197 km from the Guzar Substation to the Surhan Substation are under development with the IDB.

Processing of oil and condensates

Oil refining

Refining is carried out mainly at two major refineries, one located in Fergana and the other in Bukhara. The full treatment capacity of these two installations is estimated at 11.2 million tons of oil and condensates annually.

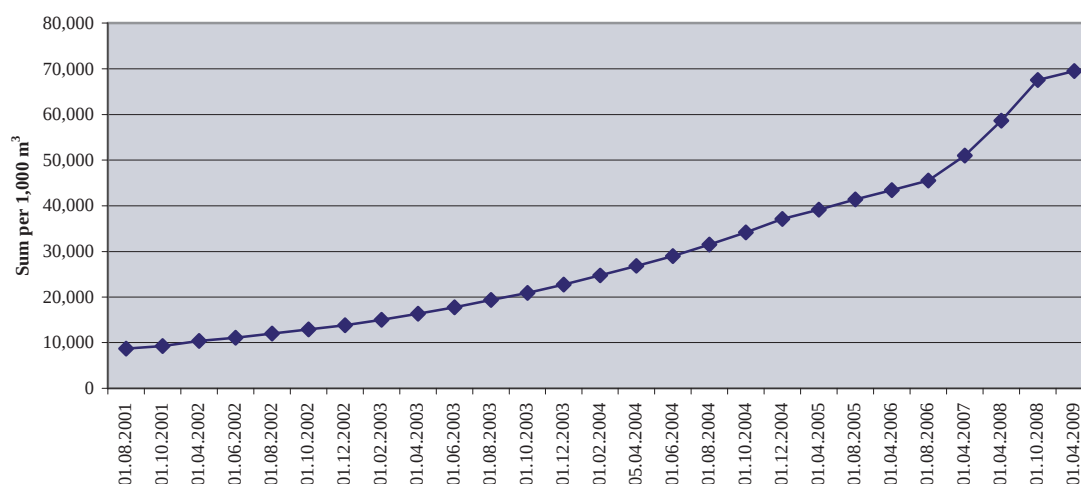
The Fergana refinery (FNPZ) has a production capacity of 8.7 million tons/year, taking into account the production of its subsidiary refinery Alty-Ariki, located in Khamza, and produces fuel and oil for motors and transmission. The Bukhara refinery (BNPZ) produces fuel, automobile gas oil and kerosene for aviation.

In 2005, construction began of a third refinery located in Djarkourgan in the Surkhandarya region. The project is estimated to cost US\$ 7 million. At full capacity, the refinery would process 130,000 tons of petroleum per year, producing 50,000 tons of diesel oil, the same amount of bitumen and some other products.

Gas purification

Gas processing is carried out at three plants close to important gas mines, one in Mubarek and two in Shurtan. The Mubarek fractionation plant, constructed and launched in 1972, separates liquid gas, condensates and sulphur at low temperatures. The annual volume of processed gas is 24 billion m³.

The annual treatment capacity of the first Shurtan gas processing plant, constructed and launched in 1980,

Figure 8.4: Price of gas purchased by Uzbekenergo

Source: Uzbekenergo, 2009.

is 24 billion m³ of gas. The second one, the Shurtan Gas and Chemical Complex, was built and brought into service in 2001. The treatment capacity of this industrial complex is 4.5 billion m³ of natural gas; it produces 125,000 tons of polyethylene, 137,000 tons of liquid gas, 130,000 tons of condensates as well as 4.2 billion m³ gas and 4,000 tons of sulphur. Gas treatment technologies allow the production of 150 varieties of polyethylene, mainly intended for export.

8.3 Regulations and tariffs

The installation of metering systems certainly has an important effect on domestic gas consumption. However, the strong economic growth perceptible in the country since 2004 has also been an important factor of energy consumption growth. If the predicted rise in energy consumption were to be confirmed, the ability of the country to export gas would be reduced, as would the receipts available to conclude the modernization programme for the economy. Overall, electricity consumption has increased since 2001,

decreasing by 3 per cent for the first time in 2001–2005, before rising by 10.7 per cent in 2005–2007 to reach 40.623 Mwh (table 8.2).

It has been reported that gas and electricity cuts, mostly in rural areas and sometimes in cities, occur from time to time. During these events, rural populations have had to use coal, wood and various biofuels for heating, which may result in substantial atmospheric pollution as well as a major reduction in hedges, leading to soil erosion and drainage.

The Uzbek economy was characterized by a very low level of tariffs in the internal market and a government economic policy controlling resource allocation and investments. Since the last Environmental Performance Review (EPR), the price of energy has considerably increased in the internal market, yet the absence of independent regulation and actual unbundling of the energy sector remains a concern for international investors.

Table 8.3: Funding sources for infrastructure and social spheres in 2007, US\$ million

	State budget	Own resources	State special funds	Foreign loans	Total
Electricity	..	59.8	..	7.3	67.1
Housing communal services	5.4	..	..	63.1	68.5
Irrigation	15.0	3.1	21.5	36.7	76.3

Source: United Nations Development Programme: *Public–Private Partnership in Uzbekistan: Problems, Opportunities and Ways of Introduction*, 2007.

Tariffs are established by the Ministry of Finance and take into account a set of objective factors such as fuel expenses, salaries, normative losses, amortization and the remuneration of the operator.

The tariff reform in the electricity sector basically consisted in reducing the number of tariffs from five to two and eliminating cross-subsidies between the categories of users. In practice, the tariffs are “negotiated” every trimester (Uzbekenergo) or annually (heating).

Each quarter, Uzbekenergo submits a tariff petition to the Ministry of Finance, which assesses the need for price increases according to the information provided. The Cabinet of Ministers Secretariat has an oversight role in the sector and advises the Cabinet of Ministers on whether to accept, reject or modify the recommendations of the Ministry of Finance.

The energy sector in Uzbekistan is still almost entirely owned by the Government. Therefore, investment potential is relatively limited and government control is ever-present. The Ministry of Finance is responsible for economic regulation in the energy sector. The price of gas for households was set at 30 sum/m³ in 2009, namely less than US\$ 25, with the purchase price of gas for companies being much higher. The price of gas purchased by Uzbekenergo shows a significant change in tariffs since 2004 (figure 8.4).

Electricity tariffs for households have also followed a highly rising curve since the last EPR, reflecting the rise in the price of fuel, starting with 10 sum/kWh in 2001 and rising to more than 35 sum/kWh in 2005. In 2009, the household tariff became 62 sum/kWh. There are five tariffs, including a tariff for organizations connected to a high voltage (more than 750 kW), although without a special night tariff. It is commonly assumed that these tariffs cover operating costs and maintenance for electric network exploiters and, to a lesser extent, heating networks. With regard to possible energy efficiency investments in other communal services, like water and sanitation, electricity represents more than half of the current expenses of Vodokanals (municipal water companies). The situation remains complex and many Vodokanals hardly manage to cover operating expenses through tariffs (chapter 6).

It is, however, hard to measure the consequences of these tariff developments for Uzbekenergo and for municipal controls on heating because of inflation,

on the one hand, and the different methods of tariff calculation, on the other hand.

In the electricity sector, even if measures were implemented to reduce the financial losses related to invoicing procedures or coverage, performance and losses inside the centralized system of Uzbekistan, particularly in distribution, would still remain hard to estimate.

Although the tariff increase allowed certain energy companies to become financially solvent and to undertake or plan investments with notable impacts in terms of energy efficiency, numerous communal service companies are still overdrawn. Uzbekenergo has already launched important reconstruction work on its distribution network and is considering the construction of a co-generation power plant in the Navoi and Tashkent regions.

Over the period 2001–2008, the State’s disengagement in terms of municipal infrastructure sponsorship is, however, alarming. It results in a lack of investment, the prolongation of settled capital and a high dependency on international investments (table 8.3).

Another important consequence of this mode of tariff regulation is the weak attraction of companies to private investors. In fact, in practice, poor capital yield limits private–public partnerships to the field of management without investments.

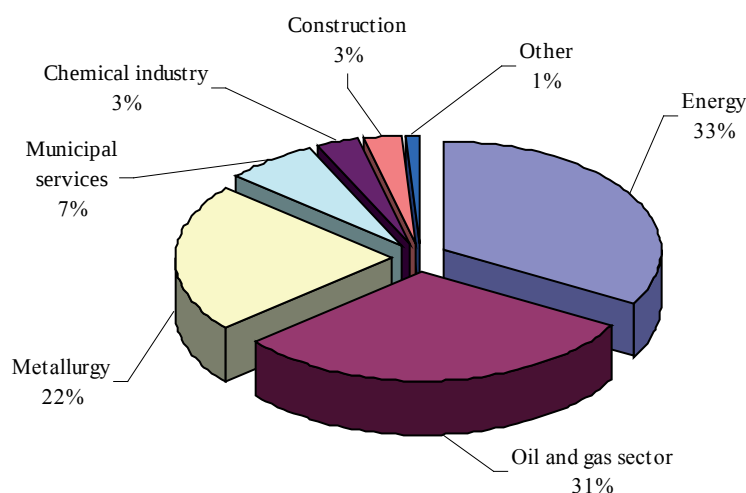
The Uzbek authorities are aware of the potential benefits of public–private partnerships in the development of energy infrastructures. The first public–private partnership pilot project was launched in the field of electricity billing in some districts of the Tashkent region. Moreover, the industrial sector was privileged by having access to financing related to the implementation of the Kyoto Protocol.

8.4 Trade and foreign direct investment

Import/Export

The recent increase in state revenues based on hydrocarbon and hydrocarbon product exports offered a new status to the energy sector in the Uzbek economy, giving energy efficiency and export the highest priority. Total exports increased 2.8 times from 2001 to 2007, reaching US\$ 8,991 million.³

³ <http://www.ecosecretariat.org>.

Figure 8.5: Emission of polluting substances into the atmosphere from the main economic sectors

Source: State Committee for Nature Protection, 2009.

During the same period, the energy sector share in the external trade balance increased from 10 per cent to more than 20 per cent, which must be compared with the decline from 27 per cent to 12.5 per cent of cotton export, traditionally considered vital for the Uzbek state budget (table 8.1).

Oil

For the time being, Uzbekistan is practically not exporting crude oil. Only minor quantities of crude oil are imported from Kazakhstan, while about 1 million tons/year are exported to Turkmenistan from the Kokdumalak field, which straddles the border between the two countries. However, growing domestic demand and falling output at aging fields could necessitate more imports in the not-so-distant future.

Uzbekistan is also a marginal exporter of refined products, mostly to Tajikistan and Kyrgyzstan. In 2004, Tajikistan imported about 17,000 tons of petroleum products from Uzbekistan, almost all of them diesel.

Gas

Uzbekistan is a net exporter of natural gas. Most of the exports, which run at about 15–20 per cent of production (7–11 billion m³/year), are destined for the Eastern Europe, Caucasus and Central Asia countries.

Natural gas is exported to the Russian Federation, Kazakhstan, Kyrgyzstan and Tajikistan. Owing to a lack of suppliers providing gas to Kyrgyzstan, Tajikistan and the southern regions of Kazakhstan, Uzbekistan is considering various options to increase gas exports. However, export volume was relatively low at 11.5 billion m³ in 2005, of which 8.15 billion m³ were supplied to the Russian Federation.

Although actual figures have not yet been released, the planned export volume in 2006 was 12.6 billion m³, with the Russian Federation remaining the largest purchaser at 9 billion m³, and exports to Kazakhstan, Kyrgyzstan and Tajikistan reaching 3.6 billion m³ compared to 3.35 billion m³ in 2005. From 2007, Uzbekistan planned to export 10 billion m³ to the Russian Federation alone and planned to increase exports to 16 billion m³ by 2014 and 20 billion m³ by 2020.

On 1 January 2006, Uzbekistan raised prices for Kazakhstan, Kyrgyzstan and Tajikistan from US\$ 42 to US\$ 55 per thousand m³. Gazprom buys Uzbek gas at US\$ 60 per thousand m³ and pays for transit at the rate of US\$ 1.1 per thousand m³ over 100 km. Starting from 1 January 2007, Uzbekistan increased the price of exports to US\$ 100 per thousand m³. In 2007, Central Asian countries combined efforts to align Gazprom purchase prices with European prices. In 2009, Uzbek gas is being sold for more than US\$ 300 per thousand m³.

Since 2002, Uzbekneftegaz has developed a special strategic relationship with Gazprom, which, on 6 December 2004, resulted in the approval by the Presidents of Uzbekistan and the Russian Federation of the Uzbekneftegaz–Gazprom agreement for strategic cooperation established in 2002. The agreement foresees cooperation in various ways, as follows:

- An increase in exports of Uzbek gas to the Russian Federation from 5 billion m³ in 2003 to 10 billion m³ by 2010;
- Cooperation between Uzbekneftegaz and Gazprom in the exploration and extraction of hydrocarbons under production sharing terms in the Ustuyrt Plateau region;
- Transportation through Uzbekistan of Turkmen gas purchased by Gazprom (2 trillion m³ until 2028), whereby Gazprom will act as the operator of Turkmen gas transit in Uzbekistan and will invest in doubling transit capacity (to 90 billion m³/year);
- Possible sale of 44 per cent of Uzbektransgaz shares to Gazprom as a strategic foreign investor.

In other developments, Ukraine intends to import 3 billion m³ of natural gas from Uzbekistan per year. Uzbekistan is interested in boosting its natural gas exports to Europe. Several options are under consideration. The existing major gas pipelines crossing Uzbekistan are to be restored with the help of Gazprom, which became the operator of the entire Central Asia Gas Pipeline system. An alternative is to export Uzbek gas by transit routes via Turkmenistan, Azerbaijan, Georgia, Ukraine, Turkey, the Islamic Republic of Iran and the Caspian Sea. However, this alternative can only become realistic if offtake could be secured beyond Turkey, and if the gas-producing countries along the proposed pipeline route (Azerbaijan, the Islamic Republic of Iran and Turkmenistan) agree to let Uzbek gas in the pipeline.

To the east, Uzbekistan participates in a project to export gas from Kazakhstan to China. Uzbekneftegaz and the China National Petroleum Corporation have created the joint venture Asia Trans Gaz in order to build and use a gas pipeline connecting Turkmenistan and Uzbekistan to China. This gas pipeline supplied mainly by Turkmenistan (30 billion m³/year) would also permit China to purchase gas coming from Kazakhstan.

Foreign direct investment

Most foreign direct investment, which has increased

considerably since the first EPR, is concentrated in the energy sector. The increasing importance of foreign companies in exploration activities was made possible by the opening of the Uzbek economy. In 2005, the Energy Charter secretariat noted: Uzbekistan has now embarked on the way to become a more attractive destination for foreign investors in the energy sector. Restructuring and privatization are still in a relatively early stage, but the Uzbek Government is now willing to open the energy sector to foreign investors. Full and effective implementation of the pricing and tariff reform, as well as the establishment of an independent regulator, are other key challenges. In addition, the legislative framework for foreign investors needs further development and streamlining. In this respect, it should be noted that a separate petroleum law and electricity law do not exist.

Foreign investment stock testifies to this recent and still limited opening. In 2007, it represented 7.4 per cent of GDP, compared with 49 per cent in Turkmenistan, 42 per cent in Kazakhstan and 26 per cent on average for the countries of the Commonwealth of Independent States. Foreign investment has been expanding since 2004 and focuses primarily on the gas sector.

Foreign companies from China, Malaysia, the Russian Federation, the Republic of Korea and the United Arab Emirates are investing in the country in oil prospecting, gas infrastructure, and the exploitation of coal, gas and oil fields. However, the Uzbek Government takes part in these investments, which reached 20 per cent of foreign investments in 2007.

8.5 Energy sector's major environmental impact

The SCNP is responsible for controlling the energy sector. It publishes an annual report, which is sent to the Senate. Communal services are not covered by this report. In reality, the pollution caused by heating networks is not clearly identified and controlled (figure 8.5).

The main sources of sulphur dioxide emissions are thermal power stations, boiler houses and the petrol and gas industry, which are mainly located in the regions of Tashkent, Kashkadarya, Syrdaria and Fergana. In 2006, the energy sector emitted 65,554 thousands tons of sulphur dioxide, representing 58.8 per cent of industrial emissions and 30.7 per cent of the total of sulphur dioxide emissions.

These results are related to the high amount of sulphur in gas and petrol and the high sulphur concentration in coal, of about 1.8 per cent. With regard to the latter, since the establishment of the United States Clean Air Act of 1970, the guidelines limiting throw-out were adopted in all developed countries for building new power stations in order to avoid the risks associated with acid rain. Although these directives vary according to the country, in general the coal used must have a sulphur content of less than 1 per cent, which subsequently limits the cost of filtration systems. If these standards are applied in Uzbekistan, the coal used by Uzbek power stations would become inadequate or uncompetitive because of the cost of treating the smoke.

Electricity represents the main contribution to emissions from stationary sources. For example, thermal power stations emitted about 130,000 tons of pollutants into the atmosphere in 2008. Sulphur dioxide, nitrogen oxide and carbon monoxide are major pollutants.

The structural tendency of all of these emissions is related to the increasing replacement of oil with gas. The SCNP also notes that electrical production equipment is old and has low productivity. The filtration equipment used by thermal power stations for coal is insufficient, unsuitable and not efficient in limiting sulphur emissions. In general, the SCNP indicates that the smoke content of thermal power stations does not correspond to developed country standards.

The low productivity of equipment can be explained by old installations and even more so by the fact that the low efficiency of fuel (coal combustion) leads to higher emission levels and increases in production losses. A small part of the waste produced at the Angren and Novo-Angren sites is reused to produce bricks. The total amount of ash from of the Angren and Novo-Angren sites reaches 10 million tons, and the quantity produced each year reaches 500,000 tons at Novo-Angren and 120,000 tons at Angren.

Furthermore, the SCNP notes the outdated methods used for controlling thermal power station emissions and the absence of automated control systems. This situation is alarming taking into consideration the proclaimed objectives of increasing the use of coal in electrical production. In fact, Uzbekenergo anticipates increasing the share of coal from 5 per cent to 10 per cent in the next five years. This would lead to a large increase in emissions. However, it should be stated

that this objective was fixed for 2010 in the first EPR, although it has not been realized. In 2003, coal production was 1,847.4 tons, 2,920 tons in 2005, and today 3 million tons. This represents approximately 5 per cent of the fuel used for electricity production.

Irrigation

The Ministry of Agriculture and Water Management produces a substantial part of the hydroelectric energy used for operating the pump stations that feed irrigation canals. The consumption of 1,500 pump stations and 6,000 pumps is estimated annually at up to 8 billion kWh. The Ministry of Agriculture and Water Management and the Government are involved in a pump stations replacement plan. This plan is carried out using international public finances (Asian Development Bank, Abu Dhabi, France, Shanghai Cooperation Organisation). This plan intended to promote gravity irrigation rather than pump irrigation. In fact, a comprehensive approach combining the renewal of irrigation pumps and devices is necessary to prevent the cultures from being disorganized.

Petrol and gas

Petrol and gas production is characterized by high sulphur content (up to 2.7 per cent) in the petrol, and by the presence of toxic contaminants and the corrosion of sulphurous hydrogen in natural gas. The oil and gas processing industry is the second most important fixed source of the country's air pollution.

The petrol and gas industry emits annually more than 96.6 thousand tons of pollutants. The SCNP identifies the contributions made by the principal industrial polluters, as follows:

- Sulphur dioxide from gas combustion at Uzgeoburneftegazdobyicha installations, which also produce carbon monoxide, nitrogen oxide, hydrogen sulphide and solid particles.
- The companies that emit pollutants into the atmosphere each year (figures in thousands of tons): Mubarek GPZ (43.9); Shurtaneftegaz (22.8); Fergana refinery (14.0); underground gas storage in Northern Sokh (10.9); and the Boukhara petrol refinery (6.7).

The outlets of the gas transport network (13,000 km) and the two underground gas storage installations are also sources of pollution. The annual indicative level of outlets increased from 12 million to 78 million m³/year. According to the control organization Uzneftgaz Inspectorate, 13 emergency cases were

reported by Uztransgaz for the period of 2003 to the first quarter of 2004, causing the loss of 156.2 million m³.

Local branches of the SCNP identified systematic deviances in the authorized maximum limits of emissions, particularly concerning Shurtanneftegaz: sulphur dioxide (1.2–4.4 times), nitrogen oxide (1.5–1.9 times); and sulphur dioxide (1.2 times) for Mubarek. In addition, major gas and oil companies did not establish any automatic systems to control pollution emissions.

8.6 Conclusion and recommendations

Energy efficiency is a cross-sectoral subject involving all sectors of economic activity. International experience has shown that national policies benefit considerably from setting up an agency dedicated to this particular subject. Today, 30 agencies for sustainable energy exist around the world. Those agencies have varying scopes of action, and some of them are responsible for subjects beyond energy efficiency per se, such as environmental protection or the development of renewable energies. These agencies also vary in terms of their statute, with some being governmental and others semi-private.

In Uzbekistan, this type of agency would contribute to the development and implementation of a national policy of energy efficiency, as well as the rational and environmental use of energy resources, particularly in communal services and especially in rural areas where there are real environmental risks related to the use of wood for heating and coal. This agency could also develop and propose an incentive mechanism for the development of energy efficiency and renewable energies. In practical terms, it would be preferable not to simply import already existing institutional models, but to create an organization that is most suitable for the country, which requires studies and benchmarking.

Recommendation 8.1:

Uzbekenergo, in cooperation with the Agency Uzkommunkhizmat and the State Committee for Nature Protection, should consider the possibility and feasibility of establishing a state agency on energy efficiency and renewable energy based on international experience in these areas.

The Uzbek authorities are aware that the preservation of their development model requires a real effort to

ensure the rational management of the country's energy resources, which will result in heavy demands on the country's public financial resources.

Annually updated and publicly available data on the main quantitative and qualitative indicators would undoubtedly be an important step towards facilitating environmental concerns in energy policy and promoting a more favourable climate for private investment. This refers also to the objectives and provisions of the public authorities concerning the evolution of energy prices in the domestic market, the evolution of demand and energy mix developments which play an important role in investment decisions. From this point of view, Uzbekistan actually suffers from low reliability in foreseeing the basic evolution parameters of the internal market, which makes it difficult to appreciate the profitability of investments in energy efficiency and renewable energies. Reliable and consistent data would allow the Government to have clear objectives and targets in the energy sector.

Recommendation 8.2:

Uzbekenergo, in cooperation with the Agency Uzkommunkhizmat and the State Committee for Nature Protection and local authorities, should draft medium-term local action plans to meet energy demands at the local level, to promote energy efficiency and to optimize the share of energy sources in the national energy balance.

The development of renewable energies is disadvantaged by the low prices currently prevailing in the domestic energy market. The experience of various solar energy projects undertaken in the country shows a real potential for the development of those technologies in Uzbekistan, in both urban and rural contexts. However, passing from the pilot to the operational stage will require government involvement.

Recommendation 8.3:

The Government should:

- (a) *Develop and adopt a package of measures consisting of three core components, namely guarantees for the long-term purchase of energy produced from renewable sources, subsidies for their purchase tariffs and tax credits;*
- (b) *Seek international assistance to develop renewable energies.*

Chapter 9

CLIMATE CHANGE AND THE ENVIRONMENT

9.1 Legal and institutional framework

Legal framework

Uzbekistan joined the United Nations Framework Convention on Climate Change (UNFCCC) in 1993 as a non-Annex I party and ratified the Kyoto Protocol in 1999.

The first legal act concerning greenhouse gases (GHGs) was the 1992 Law on Nature Protection, which focuses mostly on ozone-depleting substances and not on climate change per se. The 1996 Law on Ambient Air Protection is the legislative base for implementing measures for climate change mitigation. Several articles relate to GHGs. For example, according to Article 6, the State Committee for Nature Protection (SCNP) sets the atmospheric air protection standards for all kinds of objects, ozone preservation and climate change. Article 24 focuses on enterprises and lists their responsibilities in terms of mitigating the adverse effects of GHGs. According to the law, enterprises, institutions and organizations are expected to engage in activities aimed at reducing GHG emissions, introducing energy-efficient technologies, and engaging in energy-saving and the application of environmentally safe energy sources. The article also includes provisions on energy efficiency, adherence to established standards and the requirements and use of environmentally friendly technologies. Article 26 refers to self-reporting and government registration of the types and volumes of GHGs.

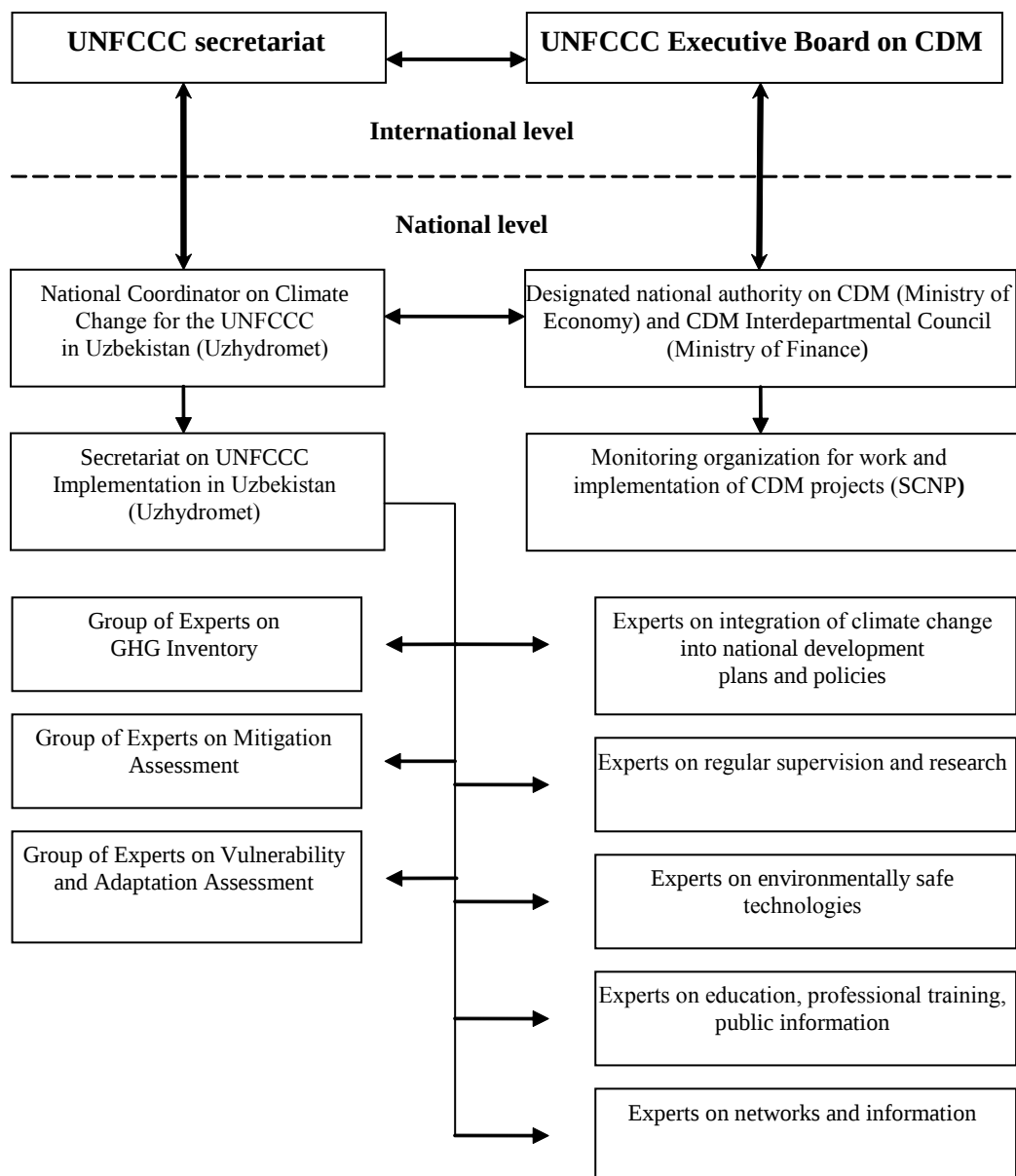
The 2000 Cabinet of Ministers Resolution on Issues concerning the Implementation of the National Environmental Action Plan of the Republic of Uzbekistan for 1999–2005 approved the National Strategy on Greenhouse Gas Emissions Reduction (Uzbekistan's mitigation strategy). The Resolution bestowed the main responsibility for the implementation and monitoring of the Strategy

upon the Centre of Hydrometeorological Service (Uzhydromet) and the Ministry of Macroeconomics and Statistics, which subsequently became the Ministry of Economy. The preamble refers to the activities of the country and includes economic tools, while emphasizing the need for institutional strengthening and technical activities.

The 2004 Cabinet of Ministers Resolution on the Improvement of the Hydrometeorological Service of the Republic of Uzbekistan identifies Uzhydromet as the institution responsible for UNFCCC activities, including obligations under the UNFCCC and the United Nations Convention to Combat Desertification in Countries Experiencing Serious Drought and/or Desertification, Particularly in Africa (UNCCD). The 2006 Presidential Decree on Measures on the Realization of Investment Projects in the Framework of the Interdepartmental Council on the Clean Development Mechanism of the Kyoto Protocol provides the institutional and legal framework for the implementation of the Clean Development Mechanism (CDM) in Uzbekistan.

The 2007 Cabinet of Ministers Resolution on the Approval of the Regulations for the Development and Implementation of the Investment Projects in the Framework of the Clean Development Mechanism of the Kyoto Protocol consolidates the order of preparation and realization of investment projects within the CDM. The Resolution established the Interdepartmental Council and its functions in overseeing the overall mechanism. It also clarified the functions of the designated national authority on the preparation of projects; the processes for submitting approved projects to the Interdepartmental Council and, following its approval, to the UNFCCC Executive Board; and the provisions on monitoring the implementation of investment plans. Lastly, the Resolution regulated the investment and taxation regime concerning foreign investors (profits exempt from taxation).

Figure 9.1: Climate change institutional structure



Institutional framework and institutional capacity

The original institutional structure following the signing of the UNFCCC included the National Commission on Climate Change, which was created in 1995. The National Commission was headed by the Deputy Prime Minister and included representatives of ministries and departments engaged in environmental management and policy implementation.

The National Commission was abolished and subsequently replaced by a new institutional structure, which carries out two key functions: (i) the fulfilment of Uzbekistan's obligations under the UNFCCC,

the most prominent of which being the periodic national communication, including the national GHG inventory report; and (ii) overseeing the country's participation in the CDM, the only instrument under the Kyoto Protocol available for non-Annex B countries (see section on CDM later in this chapter).

The most important function is the preparation of the country's GHG inventory and national communications under the UNFCCC, which is carried out by teams of experts from the relevant ministries, departments, industrial enterprises and companies, scientific-research institutes, research-and-production centres, and non-governmental organizations (figure 9.1). Further functions include the provision of information on actual and expected changes

in hydrometeorological conditions, the level of environmental pollution, and emergency information concerning the occurrence of extreme weather events. Uzhydromet is also responsible for providing estimates of the potential impacts of climate change and making recommendations concerning adaptation measures and strategies.

Day-to-day operations, including those related to the national communications, are coordinated by the Secretariat on UNFCCC Implementation under Uzhydromet. The National Coordinator on Climate Change for the UNFCCC in Uzbekistan is the link between the national and international levels of the climate change institutional framework, linking work carried out at the national level with that of the UNFCCC secretariat. The National Coordinator also participates in the CDM Interdepartmental Council. Currently, the role of Uzbekistan's National Coordinator has been assigned to the General Director of Uzhydromet.

The second function of the climate change-related institutional framework in Uzbekistan is its participation in the global CDM. The key national authority in this regard is the designated national authority on CDM, whose main function is to assist the implementation of CDM projects in the country, through their approval at the national level and their submission and registration by the UNFCCC Executive Board on CDM at the UNFCCC secretariat. The 2006 Presidential Decree on Measures for the Realization of Investment Projects in the Framework of the Interdepartmental Council on the Clean Development Mechanism of the Kyoto Protocol appoints the Ministry of Economy as Uzbekistan's designated national authority on CDM.

One of the main functions of the designated national authority is to consider and approve projects at the national level on the basis of the potential reductions in GHGs, while respecting the principle of additionality.¹ The approved projects are then considered by the second important national institution, the CDM Interdepartmental Council, which consists of senior officials from key ministries and agencies and was headed, at the time of this review, by the Minister of Finance, under his capacity

as First Deputy Prime Minister. Once approved by the Interdepartmental Council, projects are officially submitted for consideration and registration to the UNFCCC Executive Board on CDM at the UNFCCC secretariat.

The SCNP monitors the organization of work and supervises project implementation of the selected activities and measures on CDM implementation (six projects) included in the 2008 Programme of Actions on Nature Protection for 2008–2012.

9.2 National situation regarding climate change

Measurements of seasonal temperatures by district show that the average annual temperature has increased by 0.29°C since 1951. Furthermore, based on a comparison of two 30-year periods (1951–1980 and 1978–2007), data show that the number of days with temperatures lower than –20°C has declined by more than 50 per cent throughout Uzbekistan. Similarly, the number of days with temperatures lower than 15°C has declined by 28–48 per cent in the northern and mountainous regions of the country. On the other hand, the number of days with high temperatures (higher than 40°C) increased near the Aral Sea by more than 100 per cent, and in other regions by 32–70 per cent, except for foothills, where increases were more moderate (10–12 per cent).

GHG emissions: facts and trends

Annual GHG emissions produced by Uzbekistan increased by 10 per cent between 1990 and 2005 (table 9.1). Among the rest of the Central Asian countries, only Turkmenistan observed increases in GHG emissions during the same period. Kazakhstan, Kyrgyzstan and Tajikistan observed a decline in their emissions. Excluding land-use change and forestry (LUCF),² overall GHG emissions measured in million tons in carbon dioxide (CO₂) equivalent increased by 10 per cent between 1990 and 2000, and by 9.24 per cent between 1990 and 2005. When LUCF is also added, the overall increase in GHG emissions between 1990 and 2005 is 10.48 per cent. Interestingly, 2005 is the only year of available observations when LUCF overall contributes to an increase in GHG emissions, which was not the case in previous years. It should be noted that the figures in table 9.1 exclude aviation, international bunker and

¹ According to the principle of additionality, a project should only be able to earn credits through the CDM if the project, and the resulting GHG emission reductions, would not have occurred without the expectation of revenue from the Certified Emission Reductions credit trading and sales.

² Land-use change and forestry covers CO₂ absorption or emission as a result of changes in land tenure and forests.

Table 9.1: Composition of GHG emissions, in million tons in CO₂ equivalent

Gas	1990		1994		2000		2005	
	mill. tons	%	mill. tons	%	mill. tons	%	mill. tons	%
CO ₂	113.30	61.95	101.40	54.22	108.60	53.98	100.40	50.25
CH ₄	56.70	31.00	73.60	39.36	81.70	40.61	89.30	44.69
N ₂ O	12.90	7.05	12.00	6.42	10.80	5.37	10.00	5.01
HFC	..	..	..	..	0.00	0.00	0.00	0.00
Total emissions (without LUCF)	182.90	100.00	187.00	100.00	201.20	99.95	199.80	99.95
Total emissions (with LUCF)	181.30		185.60		200.20		200.30	

Sources: Second National Communication of Uzbekistan, 2008; and author's own calculations.

biomass CO₂ emissions (roughly 6.3 million tons in CO₂ equivalent in 2005).

Composition

Methane (CH₄) and CO₂ are the two main GHGs and, combined, account for approximately 93 per cent (1990) to 95 per cent (2005) of total GHG emissions. The two GHGs, however, follow different overall trends: CO₂ has declined considerably since 1990, both quantitatively and as a percentage of overall emissions. Specifically, CO₂ accounted for 61.95 per cent of total emissions in 1990, and its proportion declined steadily to 50.25 per cent in 2005. During the same period, the proportion of CH₄ increased from just 31 per cent in 1990 to 39.36 per cent in 1994, 40.61 per cent in 2000, and 44.69 per cent in 2005. This considerable increase in CH₄ emissions is largely due to the significant increase in the use and exploration of natural gas since the country's independence.

Nitrous oxide (N₂O) has declined considerably, from 7.05 per cent of total emissions in 1990 to 5 per cent in 2005. This drop in N₂O emissions for the period 1990–2005 was caused primarily by a reduction in the use of nitrogen fertilizers and significant decreases in coal production and use in energy industries, due to the replacement of coal by gas in major thermoelectric plants. Although information on hydrofluorocarbon emissions is not available for the years preceding 2000, they are insignificant, amounting to just 6,340 tons in CO₂ equivalent in 2000.

Sources

The energy sector is the dominant sector par excellence in terms of GHG emissions. Its overall share increased from 84 per cent (or 153 million tons

in CO₂ equivalent) in 1990 to 86.2 per cent (or 172.3 million tons in CO₂ equivalent) in 2005 (table 9.2). Emissions in the sector peaked in 2000, when they accounted for 87.2 per cent (175.5 million tons in CO₂ equivalent).

Within the energy sector, there are two key sources of GHG emissions: fuel combustion and fugitive emissions, mostly of natural gas. Power sector fuel combustion alone was responsible for 47.9 per cent (almost half) of total emissions in 2005. It is worth noting that its share has declined considerably since 1990, when it accounted for more than 58.5 per cent of total emissions. Unlike fuel combustion, the second key source, fugitive emissions, saw a spectacular increase in their share, from a quarter of total emissions in 1990 to 38 per cent in 2005 (45.7 million and 76.2 million tons in CO₂ equivalent, respectively).

From the remaining sectors, emissions from agriculture are the most significant at 16.4 million tons in CO₂ equivalent (or 8.2 per cent of total emissions) in 2005 – excluding CO₂ emissions from biomass (estimated at 4.5 million tons in CO₂ equivalent in 2005). The sector's share has declined from 9.3 per cent in 1990 to 8.2 per cent in 2005, although its absolute levels have remained relatively stable. Similarly, the share of industrial processes decreased from 4.4 per cent to 3.2 per cent. Emissions from the waste sector increased marginally from 2.2 per cent of total emissions in 1990 to 2.4 per cent in 2005.

Future trends in emissions

Based on facts and national forecasts, it is likely that total GHG emissions in Uzbekistan will further increase up until 2020. In terms of facts, the most

Table 9.2: GHG emissions by source, in million tons in CO² equivalent

Sector	1990		1994		2000		2005	
	mill. tons	%	mill. tons	%	mill. tons	%	mill. tons	%
Energy sector	153.7	84.0	159.3	85.2	175.5	87.2	172.3	86.2
of which:								
Power sector								
Fuel combustion	107.0	58.5	96.9	51.8	105.0	52.2	95.6	47.9
Fugitive emissions								
Oil and natural gas	45.7	25.0	61.8	33.1	70.2	34.9	76.2	38.1
Industrial processes	8.1	4.4	5.9	3.2	5.0	2.5	6.4	3.2
Agriculture	17.1	9.3	17.5	9.4	16.1	8.0	16.4	8.2
Waste	4.1	2.2	4.3	2.3	4.5	2.3	4.7	2.4
Emissions/Removals								
LUCF	-1.6	-0.9	-1.4	-0.7	-1.0	-0.5	0.4	0.2
Total								
(without LUCF)	182.9	100.0	187.0	100.0	201.2	100.0	199.8	100.0
Total								
(with LUCF)	181.4		185.6		200.1		200.2	

Sources: Second National Communication of Uzbekistan, 2008; 2000 GHG inventory; and author's own calculations.

significant current development is taking place in the energy sector, namely reverting to the use of brown coal, instead of gas, in order to power two major thermoelectric plants (Novo-Angren and Tashkent). Owing to the sector's dominance, these developments will potentially have a significant impact on future total GHG emissions in the country (see also section on energy policy).

National experts produced long-term GHG emission forecasts until 2020, as part of the Second National Communication. Four scenarios were studied and, depending on the scenario, GHG emissions will increase from 10 to 15 per cent.

Foreseeable impacts in the country

Global warming and other climatological changes

Global warming and its accompanying climatological changes have considerable implications affecting or threatening key social, economic and environmental aspects of life in the country at present; in the near future, this situation is set to worsen (box 9.1).

The rise in average temperatures, in turn, has serious climatological consequences. Increases in the number of abnormally arid and warm periods change the cycle of water resources formation, leading to abnormal and extreme weather phenomena, including prolonged droughts and very heavy precipitation.

Furthermore, glaciers and snow reserves, the natural regulators of water flows in the ecosystem, are

adversely affected by the rise in average temperatures, with potentially devastating implications. Although neither glacial recession nor a reduction in snow reserves threatens to reduce available water resources in the short term – on the contrary, they may increase them – the long-term implications will be glacier and snow-fed runoff reduction, thus increasing the frequency and extent of hydrological droughts.

Droughts may be the result of natural causes (climate, remoteness from natural water flows and the area of flow formation), as well as of anthropogenic factors, including water use and consumption practices. This is particularly the case in certain regions located in the midstream and downstream of the Amu Darya River, such as the Republic of Karakalpakstan and the regions of Khorezm, Bukhara and Navoi, where droughts occur much more frequently than on average across the country.

Alongside droughts, Uzbekistan is vulnerable to other extreme phenomena, such as high temperatures, heavy precipitation and haze, mudflows, floods and avalanches, which occur with increasing frequency. The level of preparedness is a determining factor for disaster risk reduction. It is therefore surprising that Uzbekistan has not yet established an early warning system for droughts, or taken measures for their prevention and mitigation, even though the potential for establishing such a system seems to exist.

Water supply and demand

Water availability and management for irrigation and household consumption are among the areas

Box 9.1: The regional dimension

Although the patterns of GHG emissions in the broader Central Asian region reveal commonalities, there are also considerable differences in carbon profiles. Annual GHG emissions produced by Kazakhstan, Kyrgyzstan and Tajikistan declined sharply in the 1990s, largely due to declines in industrial production and service-oriented economic restructuring. However, emissions increased in Uzbekistan and Turkmenistan. Per capita GHG emissions in Uzbekistan, as well as in Turkmenistan and Kazakhstan, are now well above global averages. Emissions per dollar of gross domestic product (GDP) produced in Uzbekistan and Turkmenistan are among the world's highest. Despite the relatively small size of its population, Kazakhstan has become one of the world's three dozen largest GHG emitters, largely due to rapid growth in its coal, oil and gas industries and its reliance on coal-fired power plants, a path currently followed also by Uzbekistan.

By contrast, Tajikistan and Kyrgyzstan continue to report per capita CO₂ emissions that are below global averages, partly because GDP and industrial output have not yet returned to pre-1990 levels, and partly because hydroelectricity plays a large role in their energy supply. Water distribution plays a major role: impoverished Tajikistan and Kyrgyzstan hold around 80 per cent of Central Asia's water resources and use their rivers to generate hydroelectric power, whereas Kazakhstan, Turkmenistan and Uzbekistan depend on downstream flows to meet irrigation needs. Additionally, there may be cases of underreporting emissions for these countries, and, by extension, of over-reporting 2005 emissions for Uzbekistan. This happens because, following practices established in the 1990s, the latter provided the former with electricity in winter when electricity was most needed in the upstream countries, so as to secure the non-release of water from massive water reserves in the upstream countries during the winter period in order to generate hydroelectricity. Instead, water releases happened during the summer period, when electricity needs were not as high in the upstream countries, but water needs for irrigation in the downstream countries peaked. Although the energy produced in thermoelectric plants in Uzbekistan is used in Kyrgyzstan, GHG emissions were registered in Uzbekistan.

most vulnerable to the impact of climate change. The total water deficit in Uzbekistan in 2005 was estimated at 2 km³. According to future projections based on scenarios developed in the Second National Communication, it is possible that the water deficit will increase to 7 km³ by 2030, rising to as much as 13 km³ by 2050. At the same time, it is estimated that the required increase in irrigation rates due to the consequences of climate change will be 5 per cent by 2030, 7–10 per cent by 2050, and 12–16 per cent by 2080.

The biggest direct threats to water availability include a reduction in available water resources in the medium to long term, together with an increase in water consumption, particularly in irrigated farming caused by increased evaporation, among others, and water quality deterioration. Another potential problem is the increase in runoff variation in time and space, particularly runoff reduction in the vegetation period. Long-term problems may include irrevocable losses in irrigated areas.

A potential reduction in river water resources will lead to serious, or even critical, problems in terms of water supply for agriculture and household consumption, and eventually public health. The regional dynamics and the transboundary nature of watercourses in the region are very important in this regard, given that the source of more than 90 per cent of surface waters in Uzbekistan lies outside the country, in Kyrgyzstan and Tajikistan. Water

resources directly formed in Uzbekistan's territory come from the Amu Darya River basin and the Syr Darya River basin. However, only 8 per cent of the total runoff is formed in the country's territory. Thus, the adequacy of water supply in Uzbekistan may be adversely affected by environmental and political developments in its upstream neighbouring countries.

Existing agreements (chapter 4) regulate the sharing of transboundary rivers between upstream and downstream countries in the region. In accordance with these agreements and depending on droughts and other parameters that may affect annually available water volume, Uzbekistan's quota of water per year has ranged from 44 km³ in 2001 (due to drought) to 59 km³ in 2005. Considering that the average long-term volume of the Amu Darya River is 73.5 km³ and 38.8 km³ for the Syr Darya River (total of 112.3 km³), Uzbekistan's share confirms that the country is the largest water consumer in the region. However, climate change may create conditions that will lead to conflicts of interest, and it is therefore very important to ensure that changes in the established balance of water use from transboundary rivers strictly adhere to regional and international agreements.

Agriculture and food security

Numerous factors influence agricultural production and crop efficiency. The most influential factors are water supply and quality, irrigation networks and technologies, and land conditions, including soil

fertility. If the current water-inefficient agricultural practices continue or are changed only marginally, climate change will inevitably lead to significant water shortages and, subsequently, to food and agricultural production shortfalls. A good example is cotton, the most important crop in the country, both in terms of exports and employment. Cotton is vulnerable to further increases in the number of days with extremely high air temperatures (over 39°C), which are expected to cause a considerable decrease in yield. Losses due to high temperatures and low moisture conditions are estimated to range from 9 to 15 per cent.

Expected increases in air temperatures will increase water losses in irrigation zones as a result of evaporation. These changes will lead to increases in demand for irrigation water to sustain agricultural output, unless drastic changes take place in irrigation technologies, practices (for example, night irrigation or the use of plastic chutes) and the choice of cultivated varieties (use of less water-intensive crops or of improved, drought-resistant varieties).

Regardless of the above, it is not foreseen that declines in land productivity due to the effects of increased soil salinity caused by irrigation will abate. Between 1995 and 2005, the areas with moderate and strong salinization increased by 14 per cent and, as a result, in 2005 more than half of the total irrigated land area (51 per cent) was saline; according to the Ministry of Agriculture and Water Management, 4 per cent of this area was highly saline, 17 per cent moderately saline, and 30 per cent slightly saline.

To satisfy increased water demand, likely short-term solutions, such as compensating for water losses by extracting groundwater reserves, will lead to the long-term aggravated exhaustion of these resources and intensify the desertification processes. The reduction by 10 per cent, according to the Ministry of Agriculture and Water Management, of irrigated land cultivated with cotton is a step in the right direction (chapter 7).

Food security via domestic production is one of the national priorities of Uzbekistan. As a result, it is estimated that approximately 80 per cent of food required for the population is produced in the country.

The combination of erratic climatic conditions, insufficient water availability and population

growth threatens to adversely impact this model of development and the ability of the country to rely on its own resources in order to sustain its current level of food self-sufficiency. The problem is compounded by the accelerating salinization and decreasing fertility of irrigated lands. Since over 90 per cent of agricultural yield is cultivated on irrigated land, without adequate adaptation measures, food security may be challenged in the near future. For instance, according to estimates, as a result of the significant droughts in 2000–2001, losses in grain crops yield amounted to 14–17 per cent (box 9.2)

9.3 Strategies and sectoral policies

Mitigation and adaptation strategies

The strategic directions of climate change mitigation are determined by key provisions of the 2000 National Strategy on Greenhouse Gas Emissions Reduction. This is Uzbekistan's national mitigation strategy.

On the adaptation front, Uzbekistan has shown a high level of awareness of the importance of adaptation measures in light of the impact of rising temperatures and climate change in the country. Unlike mitigation, however, Uzbekistan does not have a single, overarching national adaptation strategy. Efforts in that direction have started (for example, in the context of the Second National Communication with the document Towards a National Strategy for Climate Change Adaptation). So far, instead of a national adaptation strategy, adaptation is based on a number of mostly sectoral strategies and climate change adaptation measures, although they reflect the priorities of line ministries and other stakeholders rather than a coordinated strategic approach to tackling the impacts of climate change (chapters 6, 7 and 8). A strategy is necessary to optimize the allocation of scarce resources in the countries. Particular attention has been given to the efficient utilization of available water and energy resources, through the introduction of water-saving technologies, particularly in irrigation infrastructure (chapter 6).

Mitigation policies and programmes

Mitigation policies are pursued through market-based instruments (tariffs) and the implementation of various national, sectoral and regional programmes and projects.

Box 9.2: IPCC on climate change in Central Asia

According to the Intergovernmental Panel on Climate Change (IPCC), the annual mean temperature in Uzbekistan is expected to rise until 2080 by between 2.9°C and 4.3°C, causing significant problems, among others, in terms of loss in biodiversity, changes in ecosystems and higher risks of desertification. At the same time, the IPCC anticipates for Central Asia as a whole a slight fall (3 per cent) in annual precipitation and increases in evaporation due to higher temperatures. These factors increase the risk of further salinization and desertification in Uzbekistan. The German Advisory Council on Global Change (WBGU) expects that about 20 per cent of glacier volume in the Kyrgyz part of the Tian Shan mountain range will disappear before 2050. The WBGU predicts a shrinking of glacier volume by around 32 per cent up until 2050. Short-term consequences include increased risks of floods, landslides and rock falls within the near future also in Uzbekistan. Given that in the summer, 75 per cent of the water in rivers comes from melting glaciers, the long-term consequences will severely impact water availability for irrigation by the middle of the century, with irrigation agriculture in the foothills being particularly hit. Hydropower generation in Kyrgyzstan and Tajikistan will also be affected by reduced water flow in the summer periods.

According to IPCC estimates, climate change may decrease harvest yields in Central Asia by up to 30 per cent. Given the dominant role of agriculture in the Uzbek economy and society and current projections of population growth, declining agricultural production is a critical issue affecting food security in the country. Additionally, diminishing harvests due to climate change will probably decrease income in rural areas, and the younger rural population in particular might be forced to migrate to urban areas. With regard to social and political stability, such migration might create an even bigger challenge for the Government than any just-in-time reform of the agricultural and economic sectors.

For above reasons, expert studies (among the more prominent ones, The Economics of Climate Change: The Stern Review and the WBGU World in Transition – Climate Change as a Security Risk) forecast a higher risk for climate-related conflicts in Central Asia. The WBGU expects an even higher conflict potential if environmental problems and water scarcity lead ethnic groups to utilize environmental and economic resources and changes to their own benefit, for instance in the regions around the Aral Sea and the Fergana basin. The Fergana basin is the most important area of agricultural cultivation and Central Asia's most densely populated part. According to the WBGU, climate change will probably exacerbate the causes of conflicts that have erupted over access to resources in the last two decades in the Fergana basin, by potentially increasing the loss of valuable arable land, landslide risks and growing scarcity of usable water resources. Thus, inaction might fail to alleviate social impoverishment and fuel ethnic tensions in border areas. A comprehensive national adaptation strategy for Uzbekistan is the first step towards tackling these problems and reducing the probability of frictions and conflict.

Energy tariffs

Tariff policy in the energy sector is an important instrument for inducing behavioural changes towards rational energy consumption. Market pricing principles have been applied gradually, and currently among the most important energy resources, natural gas, electricity and heat power are sold at state-controlled prices. Motor petroleum, diesel fuel, heavy oil, aviation kerosene and coal are sold at controlled and exchange prices.

Not controlling for inflation, the price of natural gas for households more than doubled between January 2005, when 1,000 m³ of gas cost 9,214 sum, and November 2007, when it cost 20,540 sum. Electricity prices for households between 2000 and 2007 increased almost tenfold, from 4.7 to 43.7 sum/kWh.

Similar dramatic price increases took place in the energy sector, where heavy oil prices almost tripled and natural gas prices more than doubled between 2003 and 2007. Coal prices increased much more modestly in the same period (table 9.3).

Select programmes and projects

Metering energy and resource consumption at all stages of energy flow from its generation to consumption is a key component of the mitigation strategy (chapter 8). At the consumption/household end of the strategy, metering has been applied mostly in multi-apartment blocks for cost-effectiveness, covering gas (a wide-scale programme of 3.9 million apartments), hot water (627,000 apartments), heating (26,000 residential houses linked to district heating) and electricity (use of digital meters for electric power metering for energy sector enterprises, and multi-apartment and individual residential buildings).

The Programme for Providing Rural Settlements with Natural Gas completed in 2005, which was aimed at reducing deforestation and coal use by the rural population, provided gas to over 10,600 rural settlements and 1,200 remote rural settlements.

The Programme on Energy Saving in the Oil and Gas Sector for 2007–2012, which is currently being

Table 9.3 Prices of fuel for the energy sector, 2003, 2005 and 2007

	2003	2005	2007	Per cent increase (2003–2007)
Natural gas (sum/1,000 m ³)	20,900	39,150	51,000	144.0
Heavy oil (sum/ton)	36,076	55,900	96,000	166.1
Coal (sum/ton)	18,504	19,190	25,576	38.2

Sources: Second National Communication of Uzbekistan, 2008; and author's own calculations.

implemented, is expected to achieve a reduction in GHG emissions of 13.5 million tons in CO₂ equivalent for the period 2007–2012.

In the area of electric power generation, thermal power plants are the largest GHG emission sources in the country, and programmes aimed at energy-saving are being implemented in three of them (Tashkent, Syrdarya, and Talimardjan) through the Programme of Development and Reconstruction of Generating Capacities and the Programme of Energy Saving until 2010, which targets the electric power generation sector. Within this framework, large energy-saving projects with a total cost of US\$ 724.2 million have been scheduled (also covering hydroelectric plants). Despite the existence of provisions concerning small hydropower generation, such projects have not yet been implemented.

Despite major efforts and the implemented programmes, a strategy on renewable energy has not yet been adopted formally or put into practice.

Energy policy: gas versus coal

Uzbekistan is planning to direct US\$ 600 million to several projects on the economy of natural gas by 2021. The biggest project (US\$ 247.6 million) entails the conversion of gas boilers at the Novo-Angren thermal power station (Tashkent region) to coal-burning boilers.

According to the Ministry of Economy, by 2010 Uzbekistan will triple coal production. The extracted brown coal will then be used at power stations instead of natural gas. The Angren and Novo-Angren thermal power stations are located exactly at the beds of these coal reserves. Location is important because of the low energy density of brown coal, which makes it economically unattractive to transport (which also explains why it is not traded as extensively in the world market as other higher quality types of coal). It is often burned in power stations constructed close to mines. Emissions from brown coal-fired plants

are, all things being equal, much higher than those of comparable black coal plants.

Thermal power stations are the basis of electricity and heat generation in Uzbekistan with a capacity of 10.6 million kW, which produces about 85 per cent of electricity in the country – the remaining electricity (about 12 per cent of the total) is mostly generated in 28 hydroelectric power plants. Owing to the dominant position of thermal power stations, the main source of GHG emissions in the country is generated in the power industry and specifically in the process of fuel burning.

Electricity production is currently dominated by natural gas thermal power plants, while smaller amounts of power are produced from heavy oil and coal thermal power plants. Specifically, natural gas accounts for approximately 90.8 per cent of the electric power generated by thermal power stations, oil for 5.3 per cent and coal for 3.9 per cent. Large natural gas facilities include the Syrdarya (3,000 MW), Tashkent (1,860 MW) and Navoi (1,250 MW) plants. The largest brown coal facilities, including Novo-Angren (2,100 MW), are in the vicinity of the Angren mine near the City of Tashkent.

However, the relative shares are going to change quite substantially in the years leading up to 2015, with unclear environmental impact and implications for the amount of GHGs emitted from the power sector. These changes follow the adoption and implementation of the 2002 Programme of Coal Industry Development for 2002–2010, providing for an increase in coal mining of up to 9.4 million tons by 2010, namely, tripling the existing levels of coal production, which are approximately 3.1 million tons. At the same time, it is planned that the gas consumption of thermal power stations will be reduced and the coal-based power output increased, through the construction of the second coal supply line and equipment installation at the Novo-Angren thermal power station; the modernization of the existing coal supply facilities at the Angren

thermal power station; and efficiency increases and modernization at existing power facilities. These changes aim to increase the share of coal in the generation of electric power from 3.9 per cent to 15 per cent up until 2015. Consequently, the gas share is envisaged to decline to approximately 70 per cent.

This is a remarkable policy reversal, considering that the volume of coal mining was reduced approximately by 50 per cent between 1992 and 2000, following increases in the extraction and utilization of natural gas. The increased coal share in the fuel use structure will almost certainly increase GHG emissions (CO₂ and N₂O) in the extraction and utilization phases, despite the application of modern technologies (CO₂ capture and sequestration), which are expected to limit the growth of GHG emissions by coal burning and extraction.

The dramatic increases in brown coal combustion described above are particularly important from a GHG emissions point of view, because brown coal is of very low calorific value compared, for example, to hard coal, oil or gas. In fact, it has been estimated that coal combustion may emit almost twice as much carbon dioxide per unit of energy as the combustion of natural gas, with oil combustion falling somewhere between the two.

Even if very expensive, and far from perfect, CO₂ capture and sequestration procedures are to be used (as is currently envisaged), brown coal extraction and combustion is still very likely to lead to net increases in total GHG emissions. N₂O (a very potent GHG) increases could almost certainly take place in the extraction and processing phases (2000 GHG inventory report). In fact, the Second National Communication projects an increase in GHG emissions of 10–15 per cent, although it is not clear whether these predictions integrate increases in the scale of coal combustion.

Additionally, coal combustion is a dirtier process than gas combustion and may therefore have important environmental implications that go beyond climate change considerations, such as increased ash content and the need for ash deposits (chapter 8).

Even more importantly, no official estimates have emerged in terms of GHG emissions concerning the above-mentioned programme of gas to coal conversion. Nonetheless, environmental impact assessments (EIAs) on the projects have been

conducted by the SCNP. This is due to the fact that the current law has vague provisions covering the scope of EIAs, and does not explicitly prescribe and cover GHGs. Of course, such an analysis of GHG-related impacts would not be limited to the combustion phase, but would also need to comprehensively consider GHG emission increases and reductions, for example in the coal extraction phase, as well as reductions caused by lower losses in gas transport and extraction.

It should be added that Uzbekistan is not party to the United Nations Economic Commission for Europe (UNECE) Convention on Environmental Impact Assessment in a Transboundary Context (Espoo Convention) and has not ratified its Protocol on Strategic Environmental Assessment (SEA). It is therefore not within the country's obligations to conduct SEAs, although there is no doubt that the country would benefit from such assessments of energy sector programmes and policies with a potential impact on climate change. SEAs can be used to introduce climate change considerations into development planning. This is in line with the conclusions reached at the 2007 high-level event "The Future in Our Hands", as well as the recommendation of Intergovernmental Panel on Climate Change (IPCC) that climate change mitigation and adaptation be integrated into an overarching sustainable development strategy. The IPCC also concluded that considering climate change impacts in development planning, as might be provided by SEA, is important for boosting adaptive capacity, for example, by including adaptation measures in land-use planning and infrastructure design or by reducing vulnerability through existing disaster risk reduction strategies. Currently, a number of regional initiatives on strengthening SEA capacity are under way. One example is the work carried out by the UNECE together with the United Nations Development Programme (UNDP) and the Regional Environmental Center for Central and Eastern Europe on capacity development in Eastern Europe, Caucasus and Central Asia.³ Joining regional initiatives and mechanisms in order to develop capacity in SEA and in the implementation of the SEA Protocol would be worth considering by Uzbekistan's national authorities because of the timeliness and importance of this issue.

³ SEA Protocol: Initial Capacity Development in Selected Countries of the Former Soviet Union, available at: http://www.unece.org/env/sea/eecca_capacity.htm.



Land degradation in Surkhandarya region

9.4 Monitoring and reporting mechanisms (including inventories)

As a non-Annex I party under the UNFCCC, Uzbekistan's commitments are limited to measuring its GHG emissions, and conducting vulnerability and mitigation studies.

As part of its obligations as a non-Annex I party to the UNFCCC and a non-Annex B party to the Kyoto Protocol, Uzbekistan periodically prepares and submits to the UNFCCC national communications, namely national reports on the state of climate change mitigation, adaptation and vulnerabilities in the country. So far, Uzbekistan has submitted two national communications. The First National Communication was submitted in two parts, in 1999 and 2002. The second part mostly covered vulnerability assessments that were not covered in the first.

Climate change-related research and assessment were expanded in the 2008 Second National Communication, which included an assessment of the mitigation potential in various sectors, through the promotion and introduction of environmentally friendly technologies and practices. It also identified priority adaptation strategies and measures to reduce the negative social, economic and environmental consequences of climate change in the country. Lastly, it offered vulnerability assessments covering

key sectors and the need to develop early warning systems as part of a risk management strategy.

As part of its obligations under the UNFCCC, Uzbekistan periodically registers and presents data on GHG emission and absorption for gases not controlled by the Montreal Protocol on Substances that Deplete the Ozone Layer. The GHG inventory is compiled by Uzhydromet. The main source of data is the State Committee on Statistics. Data on emission factors are collected by the State Committee on Nature Protection, the Ministry of Agriculture and Water Management, Uzbekenergo (state joint stock company and former Ministry of Energy), Uzbekneftegaz (national holding company), Uzstroyaterialy (national joint stock company), Uzkhimneft (state joint stock company) and Uzkhimneftkhizmat (government agency responsible for communal services).

The first GHG inventory, funded by the Global Environment Facility and the UNDP, was prepared by Uzbekistan as part of its First National Communication under the UNFCCC in 1999 and offered estimates of GHG emissions for 1990 and 1994. The database underwent further improvement in the preparation of the Second National Communication.

Despite the significant progress achieved in Uzbekistan's monitoring and reporting system,

a number of important issues remain. National communications and inventories are of a periodic nature and do not cover annual developments in the country – currently only four year points exist (1990, 1994, 2000 and 2005). Although annual reporting is not within the international obligations of Uzbekistan as a non-Annex I party, more regular monitoring would produce a much more accurate picture of developments on the ground, for example, concerning the impact of major programmes aimed at replacing coal with gas in the production of electricity, which is not yet fully understood or estimated.

The problem of periodic and infrequent measurements is, however, symptomatic of a bigger issue, namely that the entire system is currently funded externally. That is true for both the First and Second National Communications and will also be the case with the third communication. The situation also affects the GHG inventory, which is funded as part of the national communication. As a result, 16 years after joining the UNFCCC and 10 years after ratifying the Kyoto Protocol, the country has not developed a sustainable system of monitoring GHG emissions. Furthermore, measurements reflected in the inventory are largely based on estimates and proxies, not on direct self-reporting from the polluting companies. This is partly due to the fact that a coherent set of instructions for self-reporting by GHG-emitting enterprises does not exist, unlike the case of pollutant reporting and the national pollutant inventory.

This situation exists despite the fact that the country has relevant experience and capacity in monitoring, reporting and self-reporting in the area of pollutants. The existing national pollutant inventory is a good illustration of this point. Ensuring that existing capacity and know-how in environmental monitoring is utilized more effectively would be of great assistance in promoting climate change mitigation and adaptation in the country. Currently, the SCNP oversees the statistical reporting relating to pollutants, whereas Uzhydromet oversees the statistical reporting relating to GHGs.

9.5 Participation in the global Clean Development Mechanism

Uzbekistan participates in the CDM as a non-Annex I party to the UNFCCC and a non-Annex B party to the Kyoto Protocol. Through this mechanism, Annex B countries that have an obligation to reduce their GHG emissions are given the opportunity to do so

through investments in developing countries, such as Uzbekistan, where the cost of reducing emissions is generally lower than in Annex B countries.

At the time of review, Uzbekistan was the only Central Asian country with projects registered by the CDM Executive Board of the UNFCCC. Specifically, six projects, all on N₂O reductions, have been registered. Registering a project is important because through that process Certified Emission Reductions (CERs) are issued to the implementing agency (governmental or private institutions). Part of the value of CERs can then be used to partly offset the costs associated with the investment required. Overall, at the time of writing, 63 projects had been approved by the Interdepartmental Council for possible inclusion in the CDM.

Despite the progress achieved, all CDM projects registered by the UNFCCC Executive Board, and therefore receiving CER credits, are on N₂O. However, N₂O accounts for only approximately 5 per cent of total emissions in the country, whereas the majority of emissions come from CO₂ and CH₄. Indeed, other projects selected by the Interdepartmental Council focusing on CO₂ and CH₄ reduction have much more potential for GHG emission reduction. Part of the problem is related to the fact that the CDM operates on a project, and not a sectoral, basis. As a result, the probability of a project being carried out relates not only to its GHG reduction potential, but also to the cost of the required investment. N₂O projects require significantly less investment and therefore are more attractive for implementation because the CER–investment ratio is very high.

9.6 Conclusions and recommendations

Melting glaciers and snow reserves, increasingly erratic climate patterns, the drying up of the Aral Sea and indications of higher water losses through evaporation, dated irrigation practices and infrastructure underlie the close links between climate change, water security and development in Uzbekistan. It is imperative to accelerate the adoption and implementation of measures to reduce the wasteful use of water and energy and to encourage more sustainable forms of agricultural development to ensure the country's sustainable development and stability. The existence of multiple sectoral programmes containing adaptation components, although indicative of a high level of awareness

among policymakers, from a policy perspective does not facilitate coordinated national actions and is therefore not conducive to achieving these objectives.

Recommendation 9.1:

Uzhydromet, in cooperation with the State Committee for Nature Protection and other relevant national authorities, should develop a national adaptation strategy as soon as possible.

The Government should adopt a national adaptation strategy as soon as possible and derive sectoral programmes, policies and projects from that strategy.

The Government should ensure that adequate funding is available for the top priorities. If that is not possible, it should seek funds either through established international market-based mechanisms, such as the Clean Development Mechanism, or through the assistance of the international community.

Significant steps have been taken in order to adjust energy policy to the new realities imposed by climate change, including through tariff-based and non-tariff-based measures. At the same time, the country is implementing a major change in energy policy which involves reverting back to brown coal as the basis of an increased portion of energy generation. Specifically, a threefold increase in the production of coal (to approximately 10 million tons) and a more than fourfold increase in the share of coal-fired energy production (from 3.9 to 15 per cent) are being implemented. Yet, no official estimates have emerged in terms of GHG emissions concerning the above-mentioned programme of gas to coal conversion. Nonetheless, environmental impact assessments on the projects have been conducted by the SCNP.

Recommendation 9.2:

The Government should initiate the process to become party to the Protocol on Strategic Environmental Assessment of the Convention on Environmental Impact Assessment in a Transboundary Context (Espoo Convention).

The State Committee for Nature Protection should initiate procedures so that the provisions defining the scope of environmental impact assessment in the current legal framework are modified to explicitly cover GHGs.

The State Committee for Nature Protection should initiate procedures to make amendments to the

current legal framework to introduce strategic environmental assessments to sectoral programmes and strategies so as to explicitly cover GHGs.

Despite the significant progress achieved in Uzbekistan's monitoring and reporting system, a number of important issues remain. National communications and inventories are of a periodic nature and do not cover annual developments in the country. Although Uzbekistan is not an Annex I country, and therefore annual reporting is not under its international obligations, more regular monitoring is needed to acquire a more accurate picture of developments on the ground, including changes in the energy sector. This situation exists despite the fact that the country has relevant experience and capacity in monitoring, reporting and self-reporting in the area of pollutants. Ensuring that existing capacity and know-how in environmental monitoring is utilized more effectively would be of great assistance in promoting climate change mitigation and adaptation in the country.

Recommendation 9.3:

In order to produce a more robust inventory of GHGs, the Government should:

- (a) Ensure that a sustainable system of monitoring and registering GHGs is developed, including through providing the necessary budgetary resources for this purpose;*
- (b) Ensure cooperation between key players in the statistical reporting related to the country's GHG inventory.*

Despite the progress achieved in this field, all CDM projects registered by the UNFCCC Executive Board are on N₂O. However, other projects selected by the Interdepartmental Council focusing on CO₂ and CH₄ reduction have much more potential for GHG emission reduction. Additionally, it is likely that GHGs emissions will increase as a result of the country's energy policy, which favours the conversion from gas to coal in electricity production.

Recommendation 9.4:

The Government should:

- (a) Give adequate attention to projects with a high mitigation potential, especially in terms of CO₂ and CH₄ emissions;*
- (b) Ensure CO₂ and N₂O emissions do not increase as a result of increased brown coal combustion and extraction, which is part of the country's new energy policy.*

ANNEXES

***Annex I: Implementation of the recommendations
in the first review***

***Annex II: Selected regional and global
environmental agreements***

***Annex III: Selected economic and
environmental indicators***

***Annex IV: List of major environment-related legislation in
Uzbekistan***

Annex I

IMPLEMENTATION OF THE RECOMMENDATIONS IN THE FIRST REVIEW¹

PART I: THE FRAMEWORK FOR ENVIRONMENTAL POLICY AND MANAGEMENT

Chapter 1: LEGAL INSTRUMENTS AND INSTITUTIONAL ARRANGEMENTS FOR ENVIRONMENTAL PROTECTION

Recommendation 1.1:

Oliy Majlis should: • improve law-making procedures and harmonize the law-making activities of legislative and executive bodies; • consider adopting a law on administrative procedures to guarantee that implementing regulations are developed in an appropriate and timely manner. Environmental laws should contain provisions that clarify how nature users should implement them. The legal provisions should refer to governmental regulations.

Since 2001, a number of laws and by-laws have been adopted to improve law-making procedures and to harmonize the law-making activities of legislative and executive bodies. For example, the 2003 Law on the Rules of Procedure of the Legislative Chamber of the Oliy Majlis addresses the process to be followed by the legislative chamber in considering laws and regulations. The 2003 Law on the Rules of Procedure of the Senate of the Oliy Majlis addresses the process to be followed by the Senate in considering laws and regulations. Together, these two laws synchronize the activities of the two chambers of the Oliy Majlis.

The 2004 Law on Amendments, Additions and Revocations of Certain Legislative Acts is dedicated to the procedure for submitting draft legislation to the appropriate authorities. The Law on the Procedures for the Preparation of Draft Laws and their Submission to the Legislative Chamber of the Oliy Majlis was adopted on 11 October 2006. The 2006 Regulation on the Order of Preparation and Adoption of Government Plans for Legislative Work and for Monitoring the Execution of the Resolutions of the Cabinet of Ministers calls for the Government to prepare an annual plan of legislative work.

Together, these laws and by-laws complete the executive and legislative procedures for planning, developing, agreeing to and adopting laws, as well as for their execution and monitoring.

Recommendation 1.2:

Policy documents, such as the National Action Plan for Environmental Protection and the National Environmental Action Plan, should be backed up with implementation programmes, including legislative and institutional measures and defined financing.

Two sequential implementation plans have been developed during the relevant period. The first was the Programme for Environmental Protection and the Rational Use of Natural Resources for 1999–2005, developed and coordinated by the Ministry of Economy. The second, prepared and coordinated by the State Committee for Nature Protection (SCNP), is the 2008 Programme of Actions on Nature Protection for 2008–2012.

Other strategies of importance for implementing the National Environmental Action Plan include, among others, the 2002 Concept of Integrated Sustainable Water Supply, the 2001 Strategy for the Development of the Irrigation and Drainage Sector, the National Programme on the Development of Irrigation for 2000–2005, and the 2002 Programme on Energy Efficiency.

¹ The first review of Uzbekistan was carried out in 2001. During the second review, progress in the implementation of the recommendations in the first review was assessed by the EPR Team based on information provided by the country.

In addition, a number of significant new laws have been passed since 2001 which provide the legislative basis for implementing parts of the National Environmental Action Plan. Implementation and monitoring have been further strengthened by a large body of by-laws and regulations (Refer to the second Environmental Performance Review (EPR), chapter 1, for details).

Recommendation 1.3:

Oliy Majlis and the Cabinet of Ministers need to pass relevant act on access to environmental information, determining the scope, type and form of information and procedures for dissemination and access. The Cabinet of Ministers should review the structure, mandates and obligations of executive agencies to ensure that they are able to provide environmental information. The relevant executive bodies will need sufficient staff and resources to collect information, analyse it and publicize it.

Uzbekistan adopted some legal and regulatory documents promoting the principles of public access to information, including environmental information. This relates to the 2002 Law on the Principles and Guarantees of Freedom of Information, the new edition of the 2002 Law on the Appeals of Citizens, and the 2007 Cabinet of Ministers Resolution on Measures for Further Interaction of Public and State Economic Management Bodies and Local Public Authorities with Legal and Natural Persons using Information and Communication Technologies.

Recommendation 1.4:

The Cabinet of Ministers should adopt regulations with clear provisions referring to assessment of environmental damages caused before privatisation and determine the liability for past pollution.

There are specific liabilities, for example in the 2002 Law on Subsoil, yet this Law does not relate to damage caused before privatization or liability for past pollution. One of the responsibilities of the mining industry is to ensure environmental assessment, environmental protection and restoration of damaged land areas and other natural sites disturbed during excavation, and this obligation does not expire. It does not, however, relate to pre-privatization damage.

A current pilot project, registered with the Ministry of Justice, is relevant. This project attempts to establish the methodological basis for procedures that could be used to assess and remediate environmental damage. Since the impact of certain industrial activities is likely to vary according to factors such as climate, topography and vegetation cover, the pilot project is being implemented on a region-by-region basis.

Recommendation 1.5:

The State Committee for Nature Protection should initiate cooperation with non-governmental organizations to implement common projects. It also should initiate a process whereby NGOs with science expertise may advise the Committee on scientific aspects of environmental decisions. Advocacy groups should publish guidebooks for the courts and citizens on the procedures involved in environmental disputes and defending the environmental rights of citizens.

The SCNP is financially supporting environmental non-governmental organizations (NGOs) from its National Fund for Nature Protection. Grants have been provided for environmental education purposes. To promote cooperation with NGOs, the SCNP plans to sign a memorandum of understanding with the European Eco Forum, a coalition of NGOs. It prepared recommendations for its territorial departments on the procedures and areas of cooperation with NGOs. The SCNP is considering establishing in the near future a consultative public council. The SCNP involves members of the public in the discussion of such documents by inviting the representatives of specialized NGOs to the meetings of its Collegium (management board).

Recommendation 1.6:

The Cabinet of Ministers should issue an Act to strengthen and make more precise the coordination power of the State Committee for Nature Protection. Coordination functions should include assessment of implementation of environmental legislation and adoption of plans for the development of regulations required to implement laws. The State Committee for Nature Protection should have the right to develop cross-sectoral policies in

environmental protection in consultation with other ministries and agencies. Decisions should be taken on the basis of consensus.

Pursuant to the 2003 Presidential Decree on Strengthening the Public Administration Authorities, the coordination functions of the SCNP were strengthened as they relate to nature protection activities and environmental security. The SCNP also has the right to develop draft cross-sectoral policies in environmental protection that are then circulated for comments and eventual consensus among other ministries and agencies.

In addition, a number of new regulations governing the monitoring role of the SCNP have strengthened the Committee's authority to assess the implementation of environmental legislation. These include: (i) the 2002 Cabinet of Ministers Resolution on the Adoption of the Regulations on State Environmental Monitoring; (ii) the 2006 Cabinet of Ministers Resolution on the Approval of the Programme for Monitoring the Environment for 2006–2010; (iii) the 2003 Cabinet of Ministers Resolution on the Adoption of the Environmental Monitoring Programme of the Republic of Uzbekistan for 2003–2005; (iv) the methodology adopted by the SCNP on 2 October 2003 to monitor pollution sources; and (v) the 2003 Execution of the Cabinet of Ministers Resolution No. 401 dd. through the 2003 SCNP Order No. 38 dd. on the Comprehensive System of Monitoring River Water Quality and Pollution Sources within the Samarkand, Navoi and Bukhara regions. Monitoring data are reported on a regular basis to the Cabinet of Ministers, the Ministry of Economy and the Ministry for Emergency Situations.

Chapter 2: INSTRUMENTS FOR ENVIRONMENTAL PROTECTION

Recommendation 2.1:

The State Committee for Nature Protection, in cooperation with the Ministry of Finance and the Ministry of Macroeconomics and Statistics should reform the existing pollution charge system to make it more effective and to provide incentives for polluters to invest in pollution abatement. This could be done by: reducing the number of pollutants on which charges are levied and focusing on the major pollutants; gradually increasing charges to levels that would provide incentives to reduce pollution; and reducing the discretionary powers of the environmental authorities.

There have been a number of reforms in the system of pollution charges since the last EPR which have created stronger incentives for investment in pollution abatement. As a result of the 2006 reform, payments for emissions and discharges above limits can be up to 10 times higher than base levels. Rates have been increased to take into account price increases. However, there have been no attempts to reform the system of pollution charges to focus on a more reduced number of pollutants. Environmental inspectors' responsibility for collecting charges has a negative impact on compliance and, therefore, on incentives to reduce pollution.

Recommendation 2.2:

The Ministry of Finance and the Agency of Communal Services need to develop sectoral financing strategies and design financing mechanisms for communal services, in order to improve water and waste management services and to allow the service companies to operate on a cost-recovery basis.

There has been some progress in ensuring the financial viability of communal services companies, with a gradual shift to cost-recovery levels. Benefits for certain categories of citizens (veterans, pensioners, teachers, others) are now paid directly from the budget (Presidential Decrees No. UP-3227 of 27.03.2003 and No. UP-3596 of 13.04.2005). However, these companies still suffer from problems of payment collection and tariffs which are too low to cover investment needs. As a result of recurrent financial problems, Presidential Decree No. PP-445 of 17.08.2006 wrote off some of the debts of these companies in order to shore up their financial position.

Recommendation 2.3:

The State Committee for Nature Protection, in cooperation with the State Taxation Committee, the Ministry of Finance and the Ministry of Macroeconomics and Statistics, should evaluate the increased use of product charges for environmental policy. The introduction of tax differentiation to encourage the use of environmentally

friendly products should be considered. The first step is to define criteria and select products; the next step is to analyse the effectiveness and efficiency of the product charges.

The system of payments for environmentally dangerous goods has not yet been developed in Uzbekistan. The 2007 Tax Code does not contain any provisions encouraging the producers of environmentally friendly products. This recommendation has not yet been implemented, although there are discussions on the introduction of levies on some environmentally harmful products.

Recommendation 2.4:

The State Committee for Nature Protection should improve financial mechanisms for environmental investment by the environmental funds, both at national and at oblast level. These mechanisms will help to set investment priorities and to increase the efficient use of the environmental funds' financial resources.

Increased revenues accruing to environmental funds raised the environmental spending made possible through these environmental funds. The National Fund for Nature Protection played a more important role than initially envisaged in the fulfilment of the Programme for Environmental Protection and the Rational Use of Natural Resources for 1999–2005. As the National Fund for Nature Protection proved a reliable source of funding for environmental spending, it is expected that it will finance an increased amount of the actions envisaged in the Programme of Actions on Nature Protection for 2008–2012, reaching around 14–16 per cent of the total. Control over local funds ensures that not less than 40 per cent of total spending is earmarked for environmental purposes. However, despite the progress made, there are still unresolved issues regarding the mechanism for adopting decisions and the transparency of the criteria used for project eligibility.

Recommendation 2.5:

The 1% environmental tax that was introduced in 1998 should be earmarked for environmental expenditures, in order to make the charges more acceptable to enterprises and to increase sources of finance for environmental activities. To redirect the revenue from this tax, the Cabinet of Ministers needs to amend the law. Such an amendment could be proposed by the State Committee for Nature Protection, the Ministry of Macroeconomics and Statistics, the Ministry of Finance and the State Taxation Committee. (See also Recommendation 3.4.)

The environmental tax was abolished in 2006 as part of a general policy to reduce the tax burden on business. Despite the name, this tax was never earmarked for environmental purposes. Moreover, as it was levied on the total costs of any enterprise, without any consideration for its environmental impact or the type of activity performed, the environmental tax could not be considered as an economic instrument.

Chapter 3: ECONOMIC DEVELOPMENT AND ENVIRONMENTAL MANAGEMENT TOOLS

Recommendation 3.1:

During the process of liberalization reform, the Ministry of Macroeconomics and Statistics, in cooperation with the State Committee for Nature Protection, should define priority programmes and activities, both the short- and long-term, focusing on a limited numbers of well-defined goals with clear economic and environmental benefit.

There has been some progress in the definition of a framework for environmental action. The SCNP is responsible for the formulation and implementation of the 2008 Programme of Actions on Nature Protection for 2008–2012. However, the level of concordance with other government departments is limited. The Programme is a conservative planning exercise that focuses on what can be done with the financing that the SCNP considers could be forthcoming, rather than an attempt to define environmental problems through a broader process of public participation. Although the 2007 Welfare Improvement Strategy for 2008–2010 also includes some environmental issues, the level of detail is more limited. In general, despite the advances observed, linkages between environmental issues and economic implications are not always clearly made.

Recommendation 3.2:

The State Committee for Nature Protection, in cooperation with the State Committee on Property and Ministry of Finance, should ensure that environmental obligations are fully described in the annual privatisation

programmes. Proposed provisions should include a list of pre-privatisation actions in order to describe the environmental situation of a company or site and specify proposals for cleaning up environmental pollution and bringing the environmental situation under control. A portion of the revenues from privatisation (up to 5%) should be used to ameliorate the environmental problems of enterprises that are being privatised. Environmental audits should be compulsory and included in the legislation on privatisation. See also Recommendation 1.4

The Privatization Programmes for 2003–2004 and 2005–2006, the 1999 Cabinet of Ministers Resolution on Privatization in 2001–2002 and the 2006 Presidential Decree on Strengthening the Processes of Privatization in 2006–2008 do not contain any provisions on such environmental obligations. The 2006 Regulation on the Procedure of Privatization of Objects of State Property requires only an assessment of environmental protection infrastructures. The environmental problems of privatized enterprises are not considered as expenses that can be financed by revenues from privatization. Environmental audits are not compulsory in cases of privatization; neither are any such requirements contained in the 1991 Law on Privatization or the 2006 Regulation on the Procedure of Privatization of Objects of State Property.

Recommendation 3.3:

The State Committee for Nature Protection, in cooperation with the Ministry of Health, the Ministry of Agriculture and Water Management, the State Committee for Geology and Mineral Resources and the State Committee for Safety in the Manufacturing and Mining Industries, should further develop the environmental permit system as a cornerstone of environmental regulation. Rules governing permits should be clearly defined and include specific indicators for measuring compliance. Where it would facilitate compliance, the State Committee for Nature Protection and large companies should enter into voluntary agreements for environmental protection. Such agreements could be concluded by different economic sectors at national and oblast levels. See also Recommendation 9.3

Uzbekistan has not developed the environmental permit system and there are no clearly formulated rules on environmental permits. In fact, instead, Uzbekistan uses the instrument of state ecological expertise of emission limit values. In 2005–2006, new separate rules on the calculation and approval of emission limit values for air emissions, water discharges and waste disposal were adopted. They are not based on the integrated approach to the regulation of pollutant emissions. Furthermore, these rules do not provide a clear picture of how environmental requirements and specific indicators for measuring compliance, other than approved emission limit values, are defined by the state ecological expertise bodies for each facility in question.

Although the new rules contain some references to the proposed measures on environmental protection that should be submitted by enterprises together with the draft emission limit values, they do not provide guidance on their review and agreement by the SCNP. There is no practice of voluntary agreements for environmental protection between state bodies and companies in the country. Therefore, this recommendation has not been implemented, despite the existence of approval procedures for emission limit values, which could not be considered as a full-featured environmental permit system for currently operating facilities.

Recommendation 3.4:

In order to provide the necessary financial support for investment programmes, the State Committee for Nature Protection, in cooperation with the Ministry of Macroeconomics and Statistics, and the Ministry of Finance, should establish an effective system of charges for the use of natural resources, and improve the system of fines for environmental pollution. This includes redirecting the revenues from the 1% environmental tax. See also Recommendation 2.5

During the reviewed period, there have been improvements in the revenue-raising ability of the pollution charges system, although these have been undermined by the transfer of the revenue collection responsibility to environmental inspectors (see implementation of recommendation 2.1). In addition, rates on natural resources taxes have been increased. There are plans for further reforms of the taxation of natural resources to encourage their rational use, following a strategy of gradual change. However, only revenues for pollution charges are earmarked for environmental purposes.

Recommendation 3.5:

The State Committee for Nature Protection should strengthen its role of participation in elaboration, implementation, supervision and assessment of effectiveness of sectoral programs and projects, including the Public Investment Programme.

The role of the SCNP in influencing the Public Investment Programme remains limited. However, the Programme of Actions on Nature Protection 2008–2012 includes a number of measures that will be financed through this investment programme, although their costs are not fully estimated. There are no widespread mechanisms in place for the assessment ex post of the environmental implications of different sectoral programmes.

Chapter 4: INTERNATIONAL COOPERATION**Recommendation 4.1:**

Uzbekistan should accede to both the Stockholm Convention on Persistent Organic Pollutants (POPs) and the Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade. These steps would facilitate its full incorporation into the world's environmental community. National responsibility for the implementation of these international agreements should be assigned to the State Committee for Nature Protection.

Accession to the Stockholm Convention on Persistent Organic Pollutants has been submitted for the third time to the Cabinet of Ministers. It can be expected that Uzbekistan will officially accede to this Convention before the end of 2009. The SCNP acts as the designated national focal point for this Convention.

The Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade is not expected to be acceded to in the years to come. The Ministry of Foreign Economic Relations, Investments and Trade, the designated national focal point, has given a negative opinion, referring to the perceived impediments in international trade that accession to the Rotterdam Convention may cause.

Recommendation 4.2:

Uzbekistan should consider acceding to the UNECE conventions: the 1979 Convention on Long-range Transboundary Air Pollution, the 1991 Convention on Environmental Impact Assessment in a Transboundary Context, the 1992 Convention on the Protection and Use of Transboundary Watercourses and International Lakes and its protocols as well as the 1992 Convention on the Transboundary Effects of Industrial Accidents, and make every effort to use the standards and procedures included in these conventions as a basis for its own bilateral agreements with neighbouring countries and for sub-regional environmental protection agreements. National responsibility for the implementation of these international agreements should be shared between the State Committee for Nature Protection, the Ministry of Agriculture and Water Management (air, environmental impact assessment and water) and the Ministry of Emergency Situations (industrial accidents).

Uzbekistan acceded to the 1992 UNECE Convention on the Protection and Use of Transboundary Watercourses and International Lakes (Water Convention) on 4 September 2007. Uzbekistan has not yet become a party to the Convention's amendments or additional protocols on water and health, and civil liability.

Uzbekistan has not yet become a party to the 1991 UNECE Convention on Environmental Impact Assessment in a Transboundary Context, but the process is well under way and accession is to be expected in the short term, possibly before the end of 2009.

Regarding the 1992 UNECE Convention on the Transboundary Effects of Industrial Accidents, the possibility of accession is under discussion. In the meantime, Uzbekistan is actively taking part in the work of the Convention, and the implementation phase of the Assistance Programme under the Convention is expected to start soon. Uzbekistan also improved and clarified the national institutional structure pertaining to this Convention.

Uzbekistan has not yet ratified the 1979 UNECE Convention on Long-range Transboundary Air Pollution. It can be tentatively concluded that the standards and procedures included in the 1992 Water Convention increasingly form a basis for bilateral agreements with neighbouring countries and for subregional environmental protection agreements. For the other agreements, this cannot yet be determined.

National responsibility for the implementation of these UNECE Conventions is indeed shared among various ministries. The role and functions of the Ministry for Emergency Situations regarding the Industrial Accidents Convention has been clarified. The roles, functions and responsibilities of the SCNP and the Ministry of Agriculture and Water Management are less well defined.

Recommendation 4.3

Uzbekistan should speed up its internal procedures enabling accession to the Aarhus Convention. Acceding to this Convention would improve environmental management and the development of public democratic processes. National responsibility for the implementation of this international agreement should be assigned to the State Committee for Nature Protection.

The Government is in the process of acceding to the Aarhus Convention. The development of public democratic processes related to environmental management has not undergone significant improvement.

Recommendation 4.4:

Uzbekistan should take measures to incorporate into the TACIS projects a project to translate into the official Uzbek language (or into Russian) and to publish the basic environmental directives, regulations and decisions of the European Union bodies. The initiative, followed by the implementation of project results, should be undertaken by the State Committee for Nature Protection in the framework of the agreements with EU.

This recommendation has not been implemented. The elements included in this recommendation are being annually forwarded by the SCNP to the European Commission Technical Assistance Coordination Bureau under the Cabinet of Ministers, for their further development and action within the Technical Assistance to the Commonwealth of Independent States (TACIS).

Recommendation 4.5:

It is necessary to strengthen the capacity of services involved in environmental matters to allow for the effective implementation of international obligations by Uzbekistan and effective use of foreign assistance. Considerations should be given to increasing the number of staff in the Department of International Relations and Programmes of the State Committee for Nature Protection, to designating an international commission (or other body) for information exchange and coordination, and to establishing a research centre or assigning the task of an information centre for environmental conventions and other international legal acts, for international environmental institutions, and for internationally supported projects carried out in Uzbekistan, to an existing body.

An information service was established within the SCNP in 2006. Its main functions include: participation in the establishment and implementation of information policy in the field of environment protection, sustainable use of natural resources and ecological safety; coverage in the national and foreign media of the relevant activities and policies in the field of environment protection; promoting the involvement of the public in discussions, decision-making and implementation processes in the field of environment protection and sustainable use of natural resources; and the coordination of the Internet and Web resources of the SCNP.

The establishment of this information service partially implements the recommendation. However, it does not coordinate the activities under the various bilateral, regional and international agreements, and is mainly an internal service for the SCNP, without a mandate for coordination among the ministries and institutions involved in the wide range of instruments.

Recommendation 4.6:

There is a need to strengthen internal (interministerial) coordination in Uzbekistan for internationally

funded environmental protection projects, especially non-investment projects. To do so it would be advisable to designate a small section within the Department of International Relations and Programmes at the State Committee for Nature Protection. This body would participate in the preparation of projects, supervise projects assigned to the State Committee as an executive agency, review the effects of the implementation of projects supervised by other ministries, and provide information for the public on projects carried out in Uzbekistan.

Units within the Cabinet of Ministers, the Parliament and implementing ministries are coordinating internationally funded projects, including those related to environmental protection. Within the State Committee for Nature Protection, there is a unit responsible for the different tasks described in the recommendation. This unit works in close cooperation with other units involved in these projects.

PART II: MANAGEMENT OF POLLUTION AND OF NATURAL RESOURCES

Chapter 5: WATER RESOURCES MANAGEMENT

Recommendation 5.1:

The Ministry of Agriculture and Water Management and other responsible bodies in cooperation with the ministries and bodies involved in water management in the riparian countries in the region should:

- *Ensure that all stakeholders are represented in the Interstate Commission for Water Coordination;*
- *Develop and implement an inter-sectoral agreement that addresses the environmental, social and economic impacts of the Aral Sea crisis and takes into account sharing of water resources, sustainable development of agriculture and energy production in the region; and*
- *Create an inspection or other control mechanism for the implementation of the agreement.*

According to the Statute of the Interstate Commission for Water Coordination (ICWC) of Central Asia, adopted on 18 September 2008, ICWC members are leaders of national water ministries or departments of state founders or of authorized representatives of country governments. The representation of all stakeholders in the ICWC is not envisaged by its Statute.

The idea of inter-sectoral agreements is not a new one, although this is a long procedure in terms of development and approval. For example, a new text of the Agreement on Water and Energy Resource Use in the Syr Darya River Basin has been prepared. However, there are some discrepancies in this Agreement that need to be settled by the countries, which have failed to reach consensus in this area for some time.

Recommendation 5.2:

The Ministry of Agriculture and Water Management and the Agency of Municipal Services and industrial enterprises, in cooperation with their counterparts in the other riparian countries, should improve existing or install new treatment facilities for industrial waste-water for the enterprises situated along the Syr-Darya and Amu-Darya rivers in order to prevent further contamination of main surface water sources in the region.

The most effective large-scale industries are based on water recycling technologies, which led to an increase in recycled wastewater volume in recent years. The discharge of polluted industrial effluents has been gradually decreasing due to the decline in industrial capacities and mainly to the activities of the environmental authorities.

In addition, the establishment of water security zones and coastal strips within 300–500 m corridors along the main rivers led to the remediation of 129 contaminated sites, reducing the impact of hazardous substances on surface water and corresponding groundwater resources.

Recommendation 5.3:

The State Administration on Hydrometeorology, the State Committee for Nature Protection, the Ministry of Agriculture and Water Management in cooperation with other riparian countries should harmonize the monitoring systems used for transboundary water, in particular the Amu-Darya and Syr-Darya rivers. This

includes the use of the same analytical methods and equipment for measuring water pollutants and the same software for processing and comparing data.

The Government approved programmes to strengthen integrated observations of water quality in specific stretches of the Amu Darya, Kashka Darya and Zarafshan Rivers. Uzbekistan does not cooperate with its neighbours in the water quality monitoring of transboundary waters, although cooperation is taking place on their use and protection.

Recommendation 5.4:

The Ministry of Agriculture and Water Management should:

- *Develop and implement a strategy for the sustainable development of agriculture that recognizes that water is scarce and that use of water for irrigation must be decreased;*
- *On the basis of this strategy, develop a plan for the use of irrigated lands, taking into account the quantity and quality of the water resources available in the region and the salinity of the soil;*
- *Improve the irrigation system and introduce water metering in agriculture;*
- *Involve the agricultural sector more actively in the management and distribution of water for irrigation.*
- *Set up an association of water users and develop the economic and legal rules for use of water;*
- *Develop regulations and norms on improving water management through restructuring state agricultural units into private ones;*
- *Develop a system of water management on the basin river principles taking into account the experience gained in the countries of the European Union, in particular those with intensive agricultural activities.*

In recent years, the Government has adopted a number of measures aimed at increasing efficiency, such as the reconstruction and maintenance of the irrigation and drainage network, reducing losses from canals and irrigated fields, water conservation and increasing the availability of water to districts with a low supply.

Optimal approaches to irrigation and water management mechanisms at various levels and in various regions of the country are being demonstrated by international organizations and donor countries. For the rehabilitation and reconstruction of the main canals and pump stations, about 60 billion sum (about US\$ 40 million) are provided by the public budget.

From 1999 to 2000, almost 1,700 water user associations (WUA) were set up. In the field of land and water use, WUAs serve an area of 2.8 million ha, 70,000 km of irrigation channels and 50,000 km of drainage network.

Recommendation 5.5:

The Ministry of Agriculture and Water Management and the Ministry of Health, in cooperation with Agency of Municipal Services, should:

- *Revise the drinking water quality standards in line with WHO guidelines;*
- *Revise the operational procedures for drinking water plant management aimed at overall quality assurance rather than end-of-station chlorination;*
- *Conduct an evaluation of economic instruments for water (including systematic use of water meters to calculate user charges) and if needed, extension programmes to educate households on rational uses of water.*
- *Build facilities for the demineralisation and recycling of collector-drainage water in order to save and protect surface water resources.*

The main aim of the Government's policy in the water sector is to promote the rational use of water and to protect water resources. It also aims to improve the efficiency and reliability of the country's water sector management, ensuring guaranteed water delivery and providing essential services both to society and natural ecosystems for the reconstruction, operation and maintenance of the existing infrastructure. The National Environmental Action Plan predetermines state policy aimed at improving the quality of surface water and groundwater.

However, for the restoration of drinking water supply and sanitation networks, as well as for the construction of new drinking water pipelines and sewage infrastructure, large amounts of money are necessary, requiring international funding to solve problems in the mid- to long-term period.

For industrial wastewater, the vodokanals regularly call for local wastewater treatment at the industrial site. If discharges occur without permission, immediate remediation is required.

On the basis of the scientific research of Uzstandard, the group of experts of relevant ministries and departments performs research on harmonizing the national standard O'z DST 950:2000 on drinking water: hygiene requirements for quality.

Recommendation 5.6:

(a) The State Committee for Nature Protection should establish Maximum Allowable Concentration (MAC) for highly toxic substances such as mercury, cyanides and chromium- and strengthen the existing MAC in line with WHO and EU standards. The Ministry of Agriculture and Water Management (MAWM) should enforce these standards and implement the requirements of the NEAP for treatment of toxic wastewater discharged by industry. (b) The MAWM and the Agency of Municipal Services should create the necessary financial resources for the implementation of the Plan on Water Supply Development, in particular by introducing of metering and appropriate pricing for water consumption.

The Sanitary and Epidemiological Supervision Department of the Ministry of Health has chemical, biological and radiological laboratories with modern equipment such as atom absorption spectroscopy, high-performance liquid chromatography and enzymatic analysis (PCR). The lists of substances that can be analysed are in accordance with World Health Organization (WHO) and MAC lists.

Since 2001, additional MACs have been introduced for mercury and chromium. Drinking water and groundwater for drinking purposes are analysed according to the national standard O'z DST 950:2000 on drinking water: hygiene requirements for quality.

Under item 2.2 of this national standard, if a water source is polluted by substances that are hazardous to human health, yet not included in the standard, territorial bodies of the Sanitary and Epidemiological Supervision Department can take decisions to introduce additional quality assurance for defining these substances and estimating their harmlessness according to their MACs.

Recommendation 5.7:

In implementing the Plan on Fresh Ground Water Use and Saving the Ministry of Agriculture and Water Management should urgently take measures to reduce the use of clean ground water for industrial and irrigation purposes with the long-term aim to restrict the use of ground water to the supply of drinking water for the population.

In many regions, the use of surface water instead of groundwater is not possible. A special licence is required for enterprises that need to use groundwater for industrial purposes, on the basis of a hydrogeological study in order to use the groundwater resources economically.

In addition, in recent years the share of industrial water recycling has been increasing. The highest rate of water recycling is reported for the industrial enterprises of the Tashkent, Navoi and Fergana regions, which also contributes to saving fresh groundwater.

Chapter 6: AIR POLLUTION

Recommendation 6.1:

The State Committee for Nature Protection and Glavhydromet should reorganize and strengthen the monitoring network; technical capacities for air quality monitoring should also be improved, including the introduction of automatic methods as well as alternate methods such as diffusion sampling for measuring air pollutants and processing air emissions data. Glavhydromet should also monitor PM_{10} . Measures should be taken to improve the technical capacities for evaluating and monitoring air pollution. In this connection training activities should also be undertaken.

Air quality monitoring has discontinued in two cities since 2002 owing to the lack funds. The Centre of Hydrometeorological Service (Uzhydromet) monitors air quality at 66 fixed monitoring stations in 25 cities in

the country. The number of mobile laboratories has decreased by 36 per cent since 2002. Air concentrations of PM₁₀ are not measured in Uzbekistan. Sampling is still carried out manually following a shorter version of the programme at most stations. The SCNP, through the State Specialized Inspectorate for Analytical Control, monitors emissions at 141 enterprises monthly. The Inspectorate develops methods for measuring polluting substances in emissions and discharges. Annually, it conducts inter-calibration exercises with the analytical laboratories of Uzhydromet, the State Committee on Geology and Mineral Resources and the Ministry of Health.

Recommendation 6.2:

The State Committee for Nature Protection and the Uzbekavtoprom Association -in cooperation with enterprises involved- should take the following measures to reduce the adverse environmental effects of the transport sector:

- *Revise existing air emission standards and develop and implement new, realistic and scientifically justified emission standards, including strict standards for the lead content of petrol that meet EU requirements;*
- *Speed up the phase-out of leaded petrol.*

According to the 2006 Presidential Decree No. PP-531, since 1 March 2007 all imported vehicles of the M2, M3 and N2 categories should comply with the Euro 2 emission standard or higher, and after 1 January 2010 with the Euro 3 standard or higher. This was seen to a greater extent as a measure to support the local production of buses and trucks in Samarkand (SamAuto). In order to implement these requirements, the SCNP and Uzstandard adopted on 28 February 2007 the temporary instructions on the environmental certification of imported vehicles of the above categories. For that purpose, the SCNP State Board for Environmental Certification, Standardization and Norms serves as the eco-certification body. In 2006, the SCNP also approved the new technical requirements for locally produced cars and microvans of the Daewoo Matiz, Nexia and Damas models, which are considered as being equivalent to the Euro 0 standard.

It was expected that the production of lead petrol in Uzbekistan would be phased out in 2008. However, there is still national production of lead petrol, which currently accounts for around 10 per cent of the total oil production. Lead petrol imports were reduced from 98.5 per cent in 2005 to 65 per cent in 2006. According to the SCNP, because of the above measures, Uzbekistan reduces air emissions of lead compounds by more than 300 tons annually. So far, recommendation 6.2 has not been fully implemented; nonetheless, it is likely that Uzbekistan will apply the Euro 2 standard to cars in the near future.

Recommendation 6.3:

The Municipalities, organisations and bodies involved in the exploitation of transport, should take urgent steps to:

- *Replace old cars, buses and trucks;*
- *Increase the use of natural gas as motor fuel, in particular in public transport;*
- *Improve car-repair services and make the technical inspection of all vehicles mandatory;*
- *Improve road quality and road infrastructure in large cities and in the country as a whole.*

In recent years, the stock of vehicles has been renewed, with new vehicles being produced in Uzbekistan and imported to the country. During the last three years, vehicle production in Uzbekistan has increased by 3 times.

By 1 January 2007, more than 102,000 vehicles were re-equipped to work on gas fuel. The Programme of Actions on Nature Protection for 2008–2012 envisages the re-equipment of another 15,000 vehicles to work on gas fuel.

Car-repair services have been further improved. The regional enterprises of the stock association Uzautotekhhimzmat of the joint stock company Uzautosanoat are equipped with diagnostic tools, gas-control equipment and devices to control toxicity and exhaust opacity. Technical inspections are mandatory for all vehicles: once a year for buses and taxis; twice a year for all other vehicles. The Ministry of Internal Affairs is responsible for carrying out technical inspections.

Road quality and road infrastructure in the country as a whole, and in large cities (Tashkent, Samarkand, Bukhara, Fergana, Karshi, Nukus) in particular, have been improved.

Recommendation 6.4:

The concerned sectors of Ministries and the industrial enterprises should make all possible efforts, including providing the financial resources, to install or modernize abatement technologies to reduce gas emissions and dust from industrial installations. The following measures should be taken urgently: • *Environmental audits should be carried out at industrial enterprises;* • *Modern abatement technologies should be installed to reduce air pollution.*

According to the SCNP, measures to reduce air pollution, such as the modernization of dust and gas cleaning systems, were taken by a number of large enterprises, including the Almalyk Mining and Processing Combine, the Navoi Mining and Metallurgical Combine and Uzmetskombinat (Metallurgical Plant in Bekabad). The 2007 Programme on the Technical and Technological Modernization of Facilities for the Production of Construction Materials for 2007–2011 addresses funding by the State and industrial enterprises for certain measures to reduce dust from cement installations. Also, the Programme of Actions on Nature Protection for 2008–2012 defines, as a measure to reduce air emissions from the energy sector, the modernization of the electrostatic precipitators at the Novo-Angren thermo power plant and indicates international organizations as the source of funding.

Despite the above-mentioned measures by the Government and enterprises aimed at reducing air pollution, there is a lack of such environmental investments in the energy, oil and gas sectors, which are major air pollution sources in Uzbekistan. Some reductions in air pollution in the energy sector during the reviewed period were achieved mostly because of an increase in the percentage of gas used for energy production instead of coal and black oil. However, in accordance with the 2002 Programme of Coal Industry Development for 2002–2010, it is planned that there will be an increased proportion of coal in the fuel resources structure in electricity production of up to 15 per cent (9.4 million tons) in 2010, in comparison with 4.7 per cent (2.7 million tons) in 2001.

In general, the implementation of recommendation 6.4 addressed by the first EPR to the ministries and industrial enterprises of Uzbekistan and requesting them to install and modernize abatement technologies was only partial and rather weak. Also, as mentioned in chapter 2 of the review, the environmental audit instrument is very rarely used in Uzbekistan and, in this respect, recommendation 6.4 has not been implemented by the country.

Recommendation 6.5:

The State Committee for Nature Protection should: • *Revise and introduce emission standards for harmful air pollutants that are consistent with EU standards;* • *Use economic incentives to encourage the introduction of cleaner production technologies (reduced taxes for environmental equipment, low charges for improving environmental protection at enterprises)* • *Harmonize the air quality standards with WHO guidelines on ambient air. See also Chapter 12*

In 2006, the new rules for setting emission limit values for ambient air were adopted in Uzbekistan: Instructions on Inventories of Pollution Sources and Setting of Air Emission Limits for Enterprises. However, the system for setting emission limit values for air pollutants still follows the soviet approach based on MACs. They are thus different from European Union (EU) emission standards, and, unlike the EU countries, Uzbekistan does not apply gradually increasing requirements on the reduction of emissions from industrial sources of air pollution and improvements in air quality.

In 2004, Uzbekistan adopted the new hygiene standards on ambient air quality in human settlements: Sanitary Rules and Standards No. 0179-04. They set MACs for 656 polluting substances and for 4 main air pollutants (dust, nitrogen oxides, sulphur dioxide and ozone). The new air quality standards adopted in Uzbekistan seem consistent with the WHO guidelines on air quality.

Despite the adoption of the new rules on setting emission limit values and the harmonization of air quality standards with WHO guidelines on ambient air, recommendation 6.5 was implemented by Uzbekistan only partially. Emission standards for harmful air pollutants are inconsistent with EU standards, and economic incentives for enterprises to promote the use of environmentally friendly technologies have not yet been implemented.

Positive economic incentives for the introduction of environmentally friendly technologies are weak, although some tax breaks are available. Environmental authorities certify that the equipment purchased fulfils the necessary requirements. Negative economic incentives, in the form of pollution charges, play a more general role (See recommendation 2.1).

Recommendation 6.6:

The State Committee for Nature Protection and the Ministry of Justice should further develop the Law on the Protection of Ambient Air, and revise existing regulations and develop new regulatory documents for its implementation.

This has not yet been carried out. However, in March 2005, the SCNP submitted its proposed plan for new legislation for 2005–2010 to the Cabinet of Ministers. The plan includes a revision of the 1996 Law on Ambient Air Protection.

Recommendation 6.7:

The State Committee for Nature Protection should speed up the process of accession to the UNECE Convention on Long-range Transboundary Air Pollution so that Uzbekistan can participate actively in the cooperation on air management in the UNECE region. (See also Recommendation 4.2)

Uzbekistan has not yet acceded to the UNECE Convention on Long-range Transboundary Air Pollution.

Chapter 7: WASTE MANAGEMENT

Recommendation 7.1:

An integrated national waste management strategy on ways and means should be drawn up as a joint effort of all stakeholders. The State Committee for Nature Protection should in the short term bring together other stakeholders, including the Ministry of Health, the Ministry of Agriculture and Water Management, the Agency on Communal Services and non-governmental organizations, and start the process of developing such a national strategy. Assistance from donor countries might be sought.

The SCNP, together with the Ministry of Health, the Uzcommunkhizmat Agency, the Sanoatkontekhnazorat State Inspectorate and the other ministries, agencies and organizations concerned, with financial and technical support from the United Nations Development Programme, the New Zealand International Aid and Development Agency and the Slovak Agency for International Development Cooperation, has prepared a draft national waste management strategy. In 2007, the Senate Committee on Agrarian Issues, Water Management and the Environment approved a draft national waste management strategy and an action plan for the period 2008–2017.

Recommendation 7.2:

Within the Goskompriroda, a department for waste management should be established with at least four waste management specialists with different expertise (hazardous waste, medical waste, non-hazardous industrial waste and municipal solid waste) and with the necessary support staff.

The Committees for Nature Protection of the Republic of Karakalpakstan, Tashkent City and the regions have separate waste management inspectorates. However, a waste management department within the Headquarters of the SCNP has not yet been established. It is quite difficult to resolve this issue as a decision to increase staff numbers should be made by the Ministry of Economy and the Ministry of Finance.

Recommendation 7.3:

An effective, mandatory and enforced reporting and data collection system should be developed and implemented as soon as possible. The system should include data processing, presentation and dissemination. The system should be run and operated by the future department for waste management. Cooperation with the Ministry of Macroeconomics and Statistics is required.

All enterprises and organizations that generate all classes of hazardous waste must annually submit a “3-ecology” (hazardous waste) statistical form. The completed form should be approved by the SCNP or its regional committees.

Recommendation 7.4:

A special, separate management scheme for hazardous medical waste that ensures its adequate disposal and includes mechanisms to render it harmless should be set up, at first on a pilot scale. The pilot project should be implemented as a joint effort by the Ministry of Health and the State Committee for Nature Protection with the support of oblast authorities, local authorities, hospitals and other stakeholders.

The Committees for Nature Protection of the Republic of Karakalpakstan, Tashkent City and the regions, together with the regional bodies of the Ministry of Health, are responsible for hazardous medical waste management. There are about 110 medical waste incinerators across the country.

Recommendation 7.5:

As soon as possible, the Ministry of Agriculture and Water Management and the State Committee for Nature Protection, should take initiatives to collect, process, utilize or destroy obsolete pesticides. One of the actions to be taken should be the construction of a central temporary storage site. In this case, processing and destruction of the obsolete pesticides could be postponed to the medium term.

There are 13 obsolete pesticide and chemical storage facilities in Uzbekistan. Some of them do not meet environmental and sanitary safety standards. The SCNP, the state stock company Uzkimesanoat and the Ministry of Health, together with the regional authorities, have prepared a draft complex plan of actions to ensure the environmental safety of the storage facilities.

Recommendation 7.6:

Burning of waste in city streets, temporary storage points and containers should be prevented as much as possible both by enforcing bans as well as by providing an adequate service. Solutions should be found and implemented at local level by local authorities and organizations such as the Uzkommunalhizmat.

The SCNP carries out preventive measures against the burning of waste in city streets. The measures also include public awareness-raising campaigns.

Recommendation 7.7:

Suitable infrastructure available in Uzbekistan should, to the extent possible, be used for waste disposal. In the short term, cement kilns could be adapted for the incineration of waste tyres and hazardous waste with a high caloric value (organic compounds, including pesticides). The result would not only be the proper destruction of the waste but also a reduction in the fuel requirements of the cement factory involved. Waste incineration in cement kilns should be achieved through negotiations between the State Committee for Nature Protection and the operators of the cement plants. The cost of adapting a cement kiln for waste incineration depends largely on the actual cement production process and on the types of waste (liquid, pasty, granulated or solid) to be incinerated.

Cement kilns have not yet been adapted for the incineration of waste tyres and hazardous waste with a high caloric value (organic compounds, including pesticides).

Chapter 8: BIODIVERSITY MANAGEMENT

Recommendation 8.1:

The State Committee for Nature Protection should, as soon as possible, be recognized as the only government body responsible for the development and management of a unified protected area system. Appropriate legal, institutional and budgetary provisions should be made for this purpose.

This has not been done yet and the situation regarding the management of a protected natural area system remains unclear. The revised 2004 Law on Protected Natural Areas simply stipulates that the management of the protected territories is carried out by the Cabinet of Ministers, local governance bodies and special authorized government bodies. Although the special authorized government bodies are not named, in current practice the authority is divided between the Forestry Management Department within the Ministry of Agriculture and Water Management, the State Committee on Geology and Mineral Resources, the SCNP and the Tashkent Regional Mayor, along with the Cabinet of Ministers and local authorities.

Recommendation 8.2:

In accordance with the Biodiversity Conservation National Strategy and Action Plan, the State Committee for Nature Protection should, as soon as possible, develop a medium to long-term plan for the development of a protected area network covering a representative sample of natural ecosystems, comprising at least 10% of the State's territory. The process of extending the protected areas should focus on maximizing national and global nature protection and biodiversity benefits, minimizing socio-economic impact and integrating international best practices. Implementation of the plan must ensure the participation and cooperation of all relevant stakeholders, including national and local government bodies and local communities.

This recommendation has not yet been implemented. See chapter 7.

Recommendation 8.3:

To achieve the objectives of a sound and sustainable management system for protected areas and to meet the international requirements for public participation, the State Committee for Nature Protection should develop and test the legal, institutional and managerial mechanisms needed to increase public participation in protected area management, taking into account the requirements of the Aarhus Convention.

The 2004 Law on Protected Natural Areas establishes that local communities must take part in the development of management plans for protected natural areas. In 2006, the SCNP prepared proposals for amendments to relevant national legislation so as to make it consistent with the 2004 Law as well as draft regulations on procedures for the development of protected natural area management plans, on a protected natural area “passport” and on the organization of visits by the public to protected natural areas. The adoption of these legal and regulatory initiatives by the Government is pending.

Recommendation 8.4:

The State Committee for Nature Protection with facilitation of Ministry of Finance, the Ministry of Macroeconomics and Statistics, and the Ministry of Agriculture and Water Management, should develop economic instruments and mechanisms for ensuring adequate financing for the implementation of the Biodiversity Conservation National Strategy and Action Plan.

The 2004 Cabinet of Ministers Resolution on the Enhancement of Oversight of the Rational Use of Biological Resources and their Imports and Exports defines payments for the use of natural resources. The 2008 Programme of Actions on Nature Protection for 2008–2012 envisages some measures to support the realization of the National Programme on Biodiversity and its Action Plan, including the preparation of a draft resolution by the Cabinet of Ministers on the creation of a protected natural areas network, the development of a programme for the sustainable use of biological resources and the development of infrastructure for the protection of fisheries. The main sources of financing for these actions are the National Fund for Nature Protection, the State Biodiversity Inspectorate and the Ministry of Agriculture and Water Management.

Recommendation 8.5:

Under the leadership of the State Committee for Nature Protection, the Academy of Science and other scientific institutions, an efficient and cost-effective biodiversity monitoring system should be established to provide the necessary information for effective biodiversity management and decision-making.

In accordance with the 2000 Cabinet of Ministers Resolution on the Adoption of the Regulations on the State Cadastre of the Flora of the Republic of Uzbekistan and the Regulations on the State Cadastre of the Fauna of the Republic of Uzbekistan, the SCNP was designated as the public authority responsible for preparing and updating the two cadastres in question. In 2006, the SCNP created the Division on Monitoring and Cadastres at its State Inspectorate for the Protection and Rational Use of Flora and Fauna and Nature Reserves. The results of its activities include maps of plant communities in the Jizzakh and Navoi regions, the inventory of wildlife in two areas in the Republic of Karakalpakstan and the reports on animal life in the Kashkadarya and Surkhandarya regions. The Division is currently preparing a report on herpetofauna of Uzbekistan in the form of a cadastre.

Recommendation 8.6:

To protect and improve its extremely vulnerable and degraded wetlands, and meet international obligations concerning the maintenance of habitats for migratory species, Uzbekistan should develop an integrated national wetland conservation plan.

With the entry into force of the Convention on Wetlands of International Importance especially as Waterfowl Habitat (Ramsar Convention) in 2002, and the designation of two wetlands under the Convention, a big step towards the implementation of this recommendation has been undertaken. However, the relationship with protected natural area governance structures and species protection needs to be developed, as well as a national wetland policy and an integrated national wetland conservation plan.

Uzbekistan faces a situation where almost all wetlands serve as collectors for drainage waters; their water levels and their very existence completely depend on water availability in the collector–drainage system. Water availability in the system depends almost entirely on agricultural activities. In view of existing water scarcity, this is an unfair battle since the agricultural use of water will always have preference over maintaining ecologically important wetlands, even designated wetlands of international importance under the Ramsar Convention.

Measures to preserve biodiversity in wetlands, including species protection, have been undertaken by the SCNP and local protection authorities (rangers and foresters) with varying degrees of success.

In 2004, Uzbekistan became a party to the Agreement on the Conservation of African-Eurasian Migratory Waterbirds. It also signed the Memorandum of Understanding concerning Conservation Measures for the Siberian Crane (*Grus leucogeranus*) in 1998, and the Memorandum of Understanding concerning Conservation Measures for the Slender-billed Curlew (*Numenius tenuirostris*) in 1994, both agreed under the Convention on Migratory Species. It has not signed the 2008 Memorandum of Understanding on the Conservation of Migratory Birds of Prey in Africa and Eurasia. However, there is no evidence that these measures have been specifically implemented.

Recommendation 8.7:

Due to the high biological and ecological importance of forests, the Forestry Department, currently established within the Ministry of Agriculture and Water Management, should be institutionally strengthened.

The new structure of the Ministry of Agriculture and Water Management was approved by the 2003 Cabinet of Ministers Resolution on Improvement of the Activities of the Ministry of Agriculture and Water Management. The Forestry Management Department is an autonomous body under the Ministry, with its Head being the Deputy Minister.

Recommendation 8.8:

All sectors that benefit from forests, particularly water management and agriculture, should contribute to the financing of forest protection and reforestation. In this connection, the Forestry Department should prepare a proposal on financing forest management for the Cabinet of Ministers.

The Ministry of Agriculture and Water Management has the main responsibility for the management of forest resources. The Forestry Management Department within this Ministry determines procedures and methods for reforestation. According to the 1999 Law on Forests, resources for forest protection and rational forest use are

raised through the state budget and other means. However, there are no explicit financing mechanisms for other sectors to contribute to the financing of forest protection measures.

Chapter 9: MINERAL RESOURCES

Recommendation 9.1:

A broad assessment of the present environmental status of tailings from mining operations and other mineral industry hot spots is necessary in order to draw up an efficient plan for environmental impact prevention and mitigation. The State Committee for Nature Protection should develop a medium-term plan for this purpose under the NEAP. Funds for its implementation may be acquired through international donor organizations. They may also be allocated from the State budget.

An analysis of radioactive waste management in national and transboundary contexts and an assessment of the waste's impact on the environment have been carried out. The Programme of Actions on Nature Protection for 2008–2012 contains the following measures:

- Deactivation of the contaminated area in the Tashkent region (Yangiabad);
- Construction of an anti-radiation barrier on the tailing dam of the Metallurgical Enterprise No. 1 in Navoi;
- Environmental remediation on the territory of the former uranium mine No. 23 in the Papskiy district of the Namangan region;
- Remediation of the land degraded by mining activities in the Navoi (1,000 ha), Bukhara (500 ha) and Samarkand (500 ha) regions.

Recommendation 9.2:

The State Committee for Geology and Mineral Resources, in cooperation with the State Committee for Nature Protection, should initiate a revision of the current mineral legislation in order to (a) address environmental matters in mineral exploration, exploitation, processing, mine closure, post-closure (maintenance) and mineral waste recycling and recovery, (b) introduce mechanisms to define past, ongoing and future environmental liability, particularly for land rehabilitation after mine closure, and (c) introduce a financial guarantee requirement in mining that would generate funds to be used either during extractive operations to address potential ongoing environmental damage or for reclamation. See Recommendation 1.4

The 2002 Law on Subsoil addresses some of these issues. Specifically, the Law stipulates that the mining industry is responsible for ensuring the environmental protection and restoration of damaged land areas and other natural sites disturbed during excavation. This responsibility has no period of expiration, but it does not apply to past pollution or degradation. The industry is also responsible for using subsoil only for the purposes licensed, following technical documentation and project design documents that have undergone environmental impact assessment, avoiding certain procedures, such as side-by-side or spot excavation, following established procedures for waste management, waste disposal and conservation, and undertaking actions against erosion. Overall, it is responsible for ensuring the rational use of the area and for preserving any valuable components.

The 2002 Law on Waste stipulates procedures for waste management, including recycling and waste reduction. The cost of carrying out these activities is borne by the enterprise, but possible sources of financing are available, as appropriate. These sources include wildlife management funds, the state budget, extrabudgetary resources and voluntary payments from legal and physical persons.

Recommendation 9.3:

The State Committee for Nature Protection, in conjunction with the State Committee for Geology and Mineral Resources, should continue to develop the regulatory system for the management of mineral resources. Particular attention should be paid to (a) the development and implementation of EIA and environmental audit guidelines, with specific requirements for EIA in mining, (b) the introduction of an accreditation system for independent firms performing EIA and environmental audits, (c) the enhancement of public participation in the EIA process, and (d) the adoption of formal environmental management as a requisite for the issuing of licences to mining companies. See Recommendation 3.3

The 2002 Law on Subsoil contains a chapter on the rational use and protection of subsoil. Also, the current Law on Subsoil does not include specific provisions on environmental impact assessment and environmental audits in the mining industry. In general, during the reviewed period no specific requirements for environmental impact assessments in the mining industry were developed by Uzbekistan. This can be seen as a step backwards with regard to environmental protection requirements in comparison with the previous law on subsoil.

General provisions on environmental impact assessment and environmental audits are still part of the legislation on state ecological expertise. The 2001 Regulations on State Ecological Expertise stipulate the list of activities subject to state ecological expertise and the procedures of state ecological expertise and environmental impact assessment. However, the legislation on state ecological expertise does not provide detailed regulations on the environmental impact assessment procedure and environmental audits (chapter 2). As regards the practical application of the environmental audit instrument, it is still rarely used in Uzbekistan and mostly only by foreign enterprises. For example, in 2004 audits were conducted on certain gas fields of the Kandym–Khauzak–Shady–Kungrad project. In general, it can be concluded that recommendation 9.3 has not been implemented by Uzbekistan.

Recommendation 9.4:

The industrial cleaner production programme should be developed as part of the NEAP and a national cleaner production centre should become as the main institution for promoting cleaner production methods in Uzbekistan. Specific pilot projects in the mining industry, particularly with respect to waste-water treatment and air pollution abatement technologies, should continue to be promoted and implemented.

With the support of the United Nations Industrial Development Organization, the Clean Technologies Centre was established and 10 projects were carried out at the enterprise level. The Clean Technologies and their Introduction Programme is being carried out. In 2007, the Senate Committee on Agrarian Issues, Water Management and the Environment approved a draft national waste management strategy and action plan for 2008–2017, which recommends introducing cleaner production and technologies. Specific environmental protection measures in the mining industry are also envisaged in the Programme of Actions on Nature Protection for 2008–2012.

Recommendation 9.5:

The Government should restructure the State Committee for Geology and Mineral Resources and create a national geological survey as a top priority.

The State Committee on Geology and Mineral Resources has been reorganized twice: once to reflect a new management structure and the second time to reflect a re-prioritization of issues that, among others, has put greater focus on environmental protection and groundwater resources.

Through its Research Institute of Mineral Raw Materials, the State Committee on Geology and Mineral Resources has a permanent Geological Environmental Expedition Survey Team, which partners the SCNP for conducting subsoil evaluations. The Team has recently completed a new inventory and re-evaluation of national resources.

Recommendation 9.6:

The State Committee for Geology and Mineral Resources should improve its monitoring system, specifically in terms of data collection, processing and dissemination. Priority should be given to provide computer equipment, and mobile devices, as well as to develop centralized databases for (a) mineral resources, (b) dangerous geological processes, in particular landslides, and (c) groundwater.

The State Committee on Geology and Mineral Resources has created databases on groundwater and mineral resources. It publishes an annual information bulletin on the state of groundwater and mineral resources and their use.

Recommendation 9.7:

The regional cooperation programme for the rehabilitation of hazardous mining tailings with a transboundary pollution impact should be implemented immediately. Funds for this purpose should be allocated from the State budget, and raised from international financing institutions.

Uzbekistan actively participates in regional cooperation on the issues of uranium tailings in Central Asia. Despite the intergovernmental agreements on waste management in the Central Asian region, implementation is being delayed due to the lack of the financial and technical resources required for implementing the recommended measures and actions.

In order to attract the attention of the international community and to mobilize donor assistance to minimize the impact of uranium waste on the population and the environment, some international meetings have recently taken place, namely the Regional Conference on Uranium Tailings: Local Problems, Regional Consequences, Global Solutions, held in Bishkek (21–24 April 2009), and the High Level International Forum on Uranium Tailings in Central Asia, held in Geneva, Switzerland (29 June 2009). During the latter meeting, a Joint Declaration was adopted and Forum participants pointed out that the Central Asian region required additional financial and other resources to manage and maintain the uranium and other toxic tailing sites at safe levels.

PART III: ECONOMIC AND SECTORAL INTEGRATION

Chapter 10: LAND, AGRICULTURE AND THE ENVIRONMENT

Recommendation 10.1:

The Ministry of Agriculture and Water Management, the State Committee on Land Resources and the State Committee for Nature Protection should improve land and water legislation, with a special focus on the development of mechanisms for its implementation as well as market economic mechanisms, which stimulate land users to conduct anti-erosion and other measures for protection and rational use of land and water resources and which create conditions for profiting from agricultural activities. (See Recommendation 5.4)

Legislation on both land and water use is in an active stage of development. Both the 1998 Land Code and the 1993 Law on Water and Water Use are being revised and will be finalized in the near future. With regard to the use of market economic instruments, only limited progress resulting in improved environmental performance can be observed. See new recommendation 7.4.

Recommendation 10.2:

The Ministry of Agriculture and Water Management, in cooperation with the State Committee for Nature Protection, should develop a law on soil fertility. This law should incorporate both economic mechanisms and agro-ecological mechanisms in an effort to increase soil fertility and improve the state of the soils overall.

The recommendation has not yet been implemented.

Recommendation 10.3:

The Ministry of Agriculture and Water Management, in cooperation with the State Committee for Nature Protection, should identify sites in different ecological or agricultural zones for the implementation of pilot projects that can illustrate the value of agricultural reform and sectoral development and attract external investment.

Pilot projects and demonstration activities are taking place relatively abundantly. The level of research is convincing. The weak point in bringing the existing knowledge to the benefit of agricultural producers is a deficient educational and agricultural extension service. The existing support infrastructure has not only been insufficient, but is also incapable of adapting to changes in the structure of production and production units. The rehabilitation of marginalized land has not been addressed sufficiently.

Recommendation 10.4:

The Cabinet of Ministers and the State Committee for Nature Protection should facilitate dialogue with all stakeholders and engage their cooperation in repairing damage caused to land and improving agricultural practices in order to reduce the environmental pressure on land.

Land reform, with major changes in farm structures and the development of water user associations, has been one form of dialogue. It has not, however, until now been centred on repairing damage and land improvement. During the preparation of the new land code, since 2006 the views of water user associations and farmers' organizations were reportedly taken into account.

Recommendation 10.5:

The Ministry of Agriculture and Water Management should introduce and implement environmentally friendly methods of agricultural production and integrated plant protection against pests and diseases to prevent increasing food contamination.

The introduction of integrated pest management and decreasing the use of the most harmful pesticides has been a consequent government policy. Also, in terms of the overall use of pesticides, the results are convincing, with levels of less than 1.5 kg/ha, compared with more than 15 kg/ha during the soviet regime.

Recommendation 10.6:

The Ministry of Agriculture and Water Management should made all efforts to upgrade and repair existing irrigation and drainage systems, as well as apply modern and efficient irrigation methods and technologies.

The State Programme for the Amelioration and Improvement of Irrigated Lands for 2008–2012 has been started. However, the continuation of the improvement of irrigation systems is still addressed and recommended in the current review, among others, the compatibility of the state programme with the necessary improvements at the water user association and farm level, and the support needed for the latter.

Recommendation 10.7:

The Ministry of Agriculture and Water Management and the State Committee for Nature Protection and State Committee on Land Resources should improve both short- and long-term planning for the use and management of agricultural land.

During the period 2001–2009, environmental concerns have been increasingly streamlined into legislation and the institutions responsible for decision-making. International cooperation in the framework of the relevant conventions, as well as regional cooperation, for example in the framework of the Central Asian Countries Initiative for Land Management, is providing valuable inputs for better management. For economic, socio-economic and sometimes political reasons, a sufficiently improved performance has not been achieved. Many of the new recommendations in this sphere relate to the seriousness of the consequences of global climate change.

Chapter 11: ENVIRONMENT AND ENERGY

Recommendation 11.1:

The respective Parliamentary Commission should revise and strengthen the enforcement of the Law on the Rational Use of Energy. In this connection a team of experts should be established to propose amendments to the Law and guidelines for its enforcement.

To comply with this recommendation, the 1997 Law on the Rational Use of Energy was amended in 2003. The responsibilities of the state control and supervision of energy efficiency, the rational use of energy and energy quality were given to the Agency for Standardization, Metrology and Certification of Uzbekistan (Uzstandard). A number of by-laws have also been adopted, including the 2003 Cabinet of Ministers Resolution on the Approval of Regulations on the Use of Electrical and Thermal Power.

Recommendation 11.2:

Each sector of the economy should draw up and adopt an energy conservation programme and integrate it into its long-term strategy and policy. These requirements should be introduced in the Law on the Rational Use of Energy and the forthcoming national energy conservation programme. Additional technical energy-saving measures should be adopted and implemented in the most energy-intensive sectors.

The 1997 Law on the Rational Use of Energy contains provisions on national, sectoral and regional programmes on the rational use of energy (Article 12). The programmes can be initiated by the Cabinet of Ministers, ministries and agencies and regional authorities. In accordance with the Law on the Rational Use of Energy, in 2002 the Cabinet of Ministers adopted the Programme on Energy Efficiency until 2010. A few Cabinet of Ministers resolutions have also been adopted, namely, the 2005 Resolution on Measures to Implement a Comprehensive Programme of Introducing Energy Saving Technologies in Communal Services and the 2006 Resolution on the Approval of the Programme of Replacing Obsolescent and Inefficient Boiler Units in Enterprises and Organizations for 2007–2008.

Recommendation 11.3

To provide financial support for government policies on the promotion of rational energy use, the Government should create, as soon as possible, an energy conservation fund with contributions from energy-saving initiatives and projects. Such a fund would facilitate the implementation of energy-efficient and environmentally sound technologies, new and renewable resources, and non-waste technologies. The creation of such a fund was foreseen in the Law on the Rational Use of Energy, but no fund was established.

This recommendation has not yet been implemented.

Recommendations 11.4:

The State Centre for Standardization (UzGosStandard) with active participation of the State Committee for Nature Protection, Uzbekneftegas and UzbekEnergo should revise the fuel-quality standards, including GOST standard 10 585-75, to limit sulphur content in heavy oil to a maximum of one per cent, set specific fuel consumption norms and emission ceilings for each power plant and set up specific energy consumption norms for the different sectors and activities.

This recommendation has not yet been implemented.

Recommendations 11.5:

The Ministry of Macroeconomics and Statistics should set fuel prices according to fuel quality, or allow producers and users to negotiate these prices.

This recommendation has not yet been implemented.

Chapter 12: HUMAN HEALTH AND THE ENVIRONMENT

Recommendation 12.1:

- *The Ministries of Transport and Health and the State Committee for Nature Protection should develop a comprehensive approach to the improvement of transport-related health effects, building on the strategies and plan of actions of the WHO Charter on Transport, Environment and Health.*
- *The Ministry of Health and the State Committee for Nature Protection, in collaboration with relevant industries, should continue the implementation of appropriate technical measures (e.g. filters) to reduce emissions from localized point sources, such as factories and energy plants. A combination of incentives and repressive measures (inspections and fines) should be used to promote technological improvements.*
- *The Ministry of Health should promote research to clarify the health impacts of dust, especially the short and long-term effects of exposure to dust contaminated by pesticide residue on the respiratory system.*
- *Glavhydromet and the State Committee for Nature Protection should reorganize the air pollution monitoring network, building on possible synergies between the equipment and facilities available to the Ministry of Health. Air quality monitoring could be made more useful for assessing health effects if some monitoring stations were relocated to places that are more representative of population exposure and if the measuring of TSP was replaced with PM_{10} , a more reliable indicator of human exposure to particulate matter.*
- *The comprehensive programme should also harmonize air quality standards with the WHO Guidelines on Ambient Air. See Recommendation 6.1*

The Sanitation and Hygiene Research Institute of the Ministry of Health developed a standard on the maximum allowable concentrations for particulate matter (PM10), SanPiN No. 0179-04: Hygienic specifications: The list of maximum allowable concentrations of polluting substances in ambient atmospheric air in the territory of the Republic of Uzbekistan. However, the monitoring of particulate matter (PM10) has not yet been carried out.

Recommendation 12.2:

• *The Ministry of Health and the food industry should adhere to and implement the WHO food and nutrition action plan as a matter of urgency.* • *Local needs assessments and inter-sectoral collaboration (e.g. between veterinary services and Ministry of Health food monitoring structures) should be included in local food protection programmes.* • *A code of hygiene practices should be distributed to all food industries and local authorities.* • *The Hazard Analysis and Critical Control Point (HACCP) system should be implemented.* • *Food handlers should be trained in the principles of food safety and hygienic handling of food.* • *Information gathering and dissemination should be strengthened, including surveillance of food-borne diseases.* • *Information campaigns to combat botulism should be improved.* • *Research should be carried out to clarify the health consequences of consuming food (e.g. milk and dairy products, butter, animal fats and oils) contaminated by pesticides or their by-products.*

The improvement in the hygiene safety of food and nutritional value of raw materials and foodstuffs was established through sanitary–epidemiological rules and norms (SanPiN No. 0138-03). The quality control of food commodities and food products is carried out in collaboration with the veterinary service by Uzstandard within the Ministry of Agriculture and Water Management. The Hazard Analysis and Critical Control Point (HACCP) also exists for enterprises in the dairy and meat industry.

The next challenges are as follows:

1. The development of new SanPiN standards: “Hygiene requirements for the shelf life and storage conditions of food products”; “Hygiene requirements for the use of nutritional supplements that will ration the use of food additives, taking into account the consumption of food and a contingent of consumers”; and “Hygiene requirements for the production of milk and dairy products”;
2. The introduction of mandatory certification for food and biologically active additives;
3. The development and approval of regulations on compulsory state registration of biologically active food additives;
4. The development of a regulatory framework for the organization of the state control of genetically modified organisms and products.

Recommendation 12.3:

The Ministry of Health should implement measures for the safe disposal of hospital waste, in particular with respect to the safe disposal of syringes. See Recommendation 7.4 The incidence of hepatitis B calls for an enforcement of hygienic measures, in particular the use of sterile, single-use disposable syringes and other medical devices and equipments.

The Sanitation and Hygiene Research Institute of the Ministry of Health had developed the standard on “sanitary rules and standards for the collection, storage and disposal of medical establishments” (SanPiN No. 0149-04). Medical waste management (collection, sorting, neutralization, transportation and processing) was improved through the management of the 3,500 countrywide incinerators for hospital waste under the activities of the Strategy and Action Plan for Waste Management.

Recommendation 12.4:

The Ministry of Health and the State Committee for Safety in the Manufacturing and Mining Industries in cooperation with enterprises and workers’ representatives should: • *Reintroduce individual protective measures and provide workers with information about their occupational health risks;* • *Apply economic instruments to encourage enterprises to observe health and safety standards, as well as to report all occupational diseases;* • *Take into greater account the psychological and social dimensions of occupational health;* • *Improve the registration of occupational diseases and injuries at regional level and across all economic sectors using general registration criteria and providing detailed and accurate information.*

By decision of the Coordinating Council, the number of audits of industrial enterprises is strictly regulated. In 2002, public health surveillance covered 31.1 per cent, and 22.7 per cent in 2008. In 2008, the number of occupational diseases amounted to 79 cases, compared with 206 cases in 2002, with a decline in the total number of cases of acute occupational diseases (two cases with three victims in 2008, to one case with one affected in 2002).

Recommendation 12.5:

The Ministry of Health, the State Committee for Nature Protection and the different agencies that have been participating in the development of the NEAP and NEHAP should continue to cooperate closely in the implementation of these plans. They should select priorities on the basis of those identified in these policy documents. An integrated approach should then be developed to environmental health management and effective and participatory procedures to carry out environmental health impact assessments.

According to all agencies mentioned in the recommendation, the coordination works on a personal and official basis. For example, priority actions described in the National Environmental Action Plan and the National Environmental Health Action Plan are implemented through the Programme of Actions on Nature Protection for 2008–2012, which is a cross-cutting programme.

Recommendation 12.6:

The State Committee for Nature Protection and the SES should explore possibilities for sharing their systematic monitoring activities, with a view to optimizing available resources, avoiding duplication and making the information provided more consistent. The State Committee for Nature Protection and the SES should also look at ways of streamlining their respective expertise processes in order to develop a single system of ecological expertise that would integrate environment and health assessments.

Pursuant to the 2002 Cabinet of Ministers Resolution on the Adoption of the Regulations on State Environmental Monitoring, environmental monitoring, including database development, is carried out jointly by the SCNP, the Centre of Hydrometeorological Service, the Ministry of Agriculture and Water Management and other concerned ministries and agencies. An information exchange system has also been developed. The Ministry of Health, as well as other ministries and agencies, is included in the overall network monitoring. For surface water monitoring the country has 1,405 permanent stations. In Bukhara, Navoi, Samarkand and Jizzakh, the centres of sanitary–epidemiological surveillance carry out regular monitoring of water quality of the Zarafshan River and its tributaries. In cooperation with the SCNP, measurements are also taken to detect illegal discharges of pollutants into surface water rivers close to economic entities, especially those located on the Zarafshan River and its tributaries.

Recommendation 12.7:

The Ministry of Health and the Committee for Nature Protection should revise existing standards and develop new ones taking into account the principles of health risk assessment and toxicological criteria, including exposure pathways, and the vulnerabilities of special population groups. The WHO guidelines provide an example of this approach.

The implementation of the Environmental Health Project (World Health Organization/Europe), financed by the European Commission, started in 2009. Among the activities described in the project, an assessment of the effects of environmental factors on public health will be carried out.

Recommendation 12.8:

The Ministry of Health should increase the resources available to the Ecology and Public Health Information System Division for the assessment and investigation of health effects and the development of a communication structure for feedback to the reporting regions and districts.

An information system on environment and health conditions is included in the structure of the state sanitary and epidemiological supervision centres of the Ministry of Health. Reports from the regions and districts are sent through different means, such as couriers and e-mail.

Recommendation 12.9:

The Ministry of Health should increase local capacity in environmental health research by doing its utmost to make it part of international and national research projects. Local awareness about existing funding mechanisms and opportunities to develop research proposals for submission to interested donors should also be increased, the results from local research should be more widely published in the international peer-reviewed literature and local experts should be more involved in the definition of study designs, and in the critical evaluation and discussion of the results.

In 2001, the country had 138 hygiene laboratories, including 23 accredited laboratories. By 2009, the number of laboratories had increased to 175. The number of accredited hygiene laboratories complying with the international standard ISO 17025:2007 has increased by two (43). In 2009, the country had 175 sanitary–hygiene laboratories at all levels, including 45 inter-sanitary laboratories.

The Sanitation and Hygiene Research Institute prepared and distributed the following standards: Hygiene requirements for production and quality perfumes and cosmetic products (SanPiN No. 0186-05); Limit-permissible concentrations and estimated allowable concentrations of exogenous harmful substances in soil (SanPiN No. 0191-05); Hygiene requirements for clothing for children and adolescents (SanPiN No. 0235-07); Hygiene requirements for children's shoes (SanPiN No. 0237-07); and maximum allowable quantity of chemicals released from materials that come into contact with food (SanPiN No. 0214-06).

Since 2005, a monitoring system near the state unitary enterprise, the Tajik Aluminium Company, in the Surkhandarya region, has been used to determine water fluoride levels in the soil. At the local and regional level, all laboratories acquired new technology allowing them to expand the range of studies of water (drinking and surface water) to heavy metal salts (lead, cadmium, copper, mercury, arsenic). The total number of investigated parameters increased from 21 in 2001 to 26 in 2009. In 2001, 12 indicators (nitrates, lead and zinc, copper and pesticides) were studied compared to 24 in 2009 (analysis method developed for chromium 3 and chromium 6, mercury, arsenic, water-soluble fluorides, a group of pesticides – synthetic pyrethroids). In the Fergana region, new analysis methods for air pollutants (benzene, xylene and toluene) were introduced. In the Navoi region, analysis methods for ammonia, acetone and sulphuric acid were also introduced. The number of investigated pollutants has increased from 28 (2001) to 32 (2008).

In the national hygiene laboratory, the Ministry of Health introduced a method of atomic absorption spectrophotometry determining the levels of mercury, arsenic, iron, lead, copper, zinc and cadmium in water and foods.

The “Health-2” programme includes measures to improve the material and technical base of health and hygiene laboratories at all levels. However, implementation has not yet started. As of the beginning of 2010, and thanks to a Kuwait Islamic Bank project, all laboratories in the country will start to be equipped with modern apparatus, not only for monitoring environmental pollution, but also for monitoring the quality of food products, polymers, and so on.

In Uzbekistan, there are 210 bacteriological laboratories, including 43 accredited under the international standard ISO 17025:2007. One of the main tasks is the biological control and safety of drinking water from surface and ground sources, agricultural soil and food products.

State sanitary supervision and control of radiation safety in Uzbekistan is carried out by 23 accredited radiological laboratories at 1,740 sites, using sources of ionizing radiation.

The draft programme for improving and strengthening the logistical base of all laboratories at all levels for five years is at the consultation stage at the Ministry of Economy.

Annex II

SELECTED REGIONAL AND GLOBAL ENVIRONMENTAL AGREEMENTS

Worldwide agreements		Uzbekistan	
		Date	Status
1958	(GENEVA) Convention on the Continental Shelf		
1958	(GENEVA) Convention on the Territorial Sea and the Contiguous Zone		
1958	(GENEVA) Convention on the High Seas		
1961	(PARIS) International Convention for the Protection of New Varieties of Plants		
1963	(VIENNA) Convention on Civil Liability for Nuclear Damage		
	1997 (VIENNA) Protocol to Amend the 1963 Vienna Convention on Civil Liability for		
1971	(RAMSAR) Convention on Wetlands of International Importance especially as Waterfowl	2001	Ac
	1982 (PARIS) Amendment		
	1987 (REGINA) Amendments		
1971	(GENEVA) Convention on Protection against Hazards from Benzene (ILO 136)		
1971	(BRUSSELS) Convention on the Establishment of an International Fund for Compensation for Oil Pollution Damage		
1971	(LONDON, MOSCOW, WASHINGTON) Treaty on the Prohibition of the Emplacement of Nuclear Weapons and Other Weapons of Mass Destruction on the Sea-bed and the Ocean Floor and in the Subsoil thereof		
1972	(PARIS) Convention Concerning the Protection of the World Cultural and Natural Heritage	1995	Ac
1972	(LONDON) Convention on the Prevention of Marine Pollution by Dumping of Wastes and 1978 (TORREMOLINOS) Amendments (incineration)		
	1980 Amendments (list of substances)		
1972	(LONDON, MOSCOW, WASHINGTON) Convention on the Prohibition of the Development, Production and Stockpiling of Bacteriological (Biological) and Toxin	1995	Ac
1972	(LONDON) International Convention on the International Regulations for Preventing		
1972	(GENEVA) International Convention for Safe Containers	1996	Ac
1973	(WASHINGTON) Convention on International Trade in Endangered Species of Wild Fauna	1997	Ac
	1979 (BONN) Amendment		
	1983 (GABORONE) Amendment	1998	Ra
1973	(LONDON) Convention for the Prevention of Pollution from Ships (MARPOL)		
	1978 (LONDON) Protocol (segregated ballast)		
	1978 (LONDON) Annex III on Hazardous Substances carried in packaged form		
	1978 (LONDON) Annex IV on Sewage		
	1978 (LONDON) Annex V on Garbage		
1977	(GENEVA) Convention on Protection of Workers against Occupational Hazards from Air Pollution, Noise and Vibration (ILO 148)		
1979	(BONN) Convention on the Conservation of Migratory Species of Wild Animals	1998	Ac
	1991 (LONDON) Agreement Conservation of Bats in Europe		
	1992 (NEW YORK) Agreement on the Conservation of Small Cetaceans of the Baltic and North Seas (ASCOBANS)		
	1995 (THE HAGUE) African/Eurasian Migratory Waterbird Agreement (AEWA)	2003	Si
	1996 (MONACO) Agreement on the Conservation of Cetaceans of the Black Sea, Mediterranean Sea and Contiguous Atlantic Area (ACCOBAMS)		

Ac = Accession; Ad = Adherence; At = Acceptance; De = Denounced; Si = Signed; Su = Succession; Ra = Ratification.

Worldwide agreements		Uzbekistan	
		Date	Status
1980	(NEW YORK, VIENNA) Convention on the Physical Protection of Nuclear Material	1997	Ac
1981	(GENEVA) Convention Concerning Occupational Safety and Health and the Working		
1982	(MONTEGO BAY) Convention on the Law of the Sea		
	1994 (NEW YORK) Agreement Related to the Implementation of Part XI of the		
	1994 (NEW YORK) Agreement for the Implementation of the Provisions of the United Nations Convention on the Law of the Sea of 10 December 1982 relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks		
1985	(GENEVA) Convention Concerning Occupational Health Services		
1985	(VIENNA) Convention for the Protection of the Ozone Layer	1993	Ac
	1987 (MONTREAL) Protocol on Substances that Deplete the Ozone Layer	1993	Ac
	1990 (LONDON) Amendment to Protocol	1998	Ra
	1992 (COPENHAGEN) Amendment to Protocol	1998	Ra
	1997 (MONTREAL) Amendment to Protocol	2006	Ra
	1999 (BEIJING) Amendment to Protocol	2006	Ra
1986	(GENEVA) Convention Concerning Safety in the Use of Asbestos		
1986	(VIENNA) Convention on Early Notification of a Nuclear Accident		
1986	(VIENNA) Convention on Assistance in the Case of a Nuclear Accident or Radiological		
1989	(BASEL) Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal	1995	Ac
	1995 Ban Amendment		
	1999 (BASEL) Protocol on Liability and Compensation		
1990	(LONDON) Convention on Oil Pollution Preparedness, Response and Cooperation		
1992	(RIO) Convention on Biological Diversity	1995	Ac
	2000 (CARTAGENA) Protocol on Biosafety		
1992	(NEW YORK) United Nations Framework Convention on Climate Change	1993	Ac
	1997 (KYOTO) Protocol	1999	Ra
1993	(PARIS) Convention on the Prohibition of the Development, Production, Stockpiling and Use of Chemical Weapons and on Their Destruction	1996	Ra
1994	(VIENNA) Convention on Nuclear Safety		
1994	(PARIS) United Nations Convention to Combat Desertification	1995	Ra
1997	(VIENNA) Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management	2008	Ac
1997	(VIENNA) Convention on Supplementary Compensation for Nuclear Damage		
1998	(ROTTERDAM) Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade		
2001	(STOCKHOLM) Convention on Persistent Organic Pollutants		

Ac = Accession; Ad = Adherence; At = Acceptance; De = Denounced; Si = Signed; Su = Succession; Ra = Ratification.

Regional and subregional agreements		Uzbekistan	
		Date	Status
1947	(WASHINGTON) Convention of the World Meteorological Organization		
1950	(PARIS) International Convention for the Protection of Birds		
1957	(GENEVA) European Agreement - International Carriage of Dangerous Goods by Road (ADR) European Agreement Concerning the International Carriage of Dangerous Goods by Road Annex A: Provisions Concerning Dangerous Substances and Articles Annex B: Provisions Concerning Transport Equipment and Transport Operations		
1958	(GENEVA) Agreement - Adoption of Uniform Conditions of Approval and Reciprocal Recognition of Approval for Motor Vehicle Equipment and Parts.		
1968	(PARIS) European Convention - Protection of Animals during International Transport 1979 (STRASBOURG) Additional Protocol		
1969	(LONDON) European Convention - Protection of the Archeological Heritage (revised in		
1976	(STRASBOURG) European Convention for the Protection of Animals Kept for Farming		
1979	(BERN) Convention on the Conservation of European Wildlife and Natural Habitats		
1979	(GENEVA) Convention on Long-range Transboundary Air Pollution 1984 (GENEVA) Protocol - Financing of Co-operative Programme (EMEP) 1985 (HELSINKI) Protocol - Reduction of Sulphur Emissions by 30% 1988 (SOFIA) Protocol - Control of Emissions of Nitrogen Oxides 1991 (GENEVA) Protocol - Volatile Organic Compounds 1994 (OSLO) Protocol - Further Reduction of Sulphur Emissions 1998 (AARHUS) Protocol on Heavy Metals 1998 (AARHUS) Protocol on Persistent Organic Pollutants 1999 (GOTHENBURG) Protocol to Abate Acidification, Eutrophication and Ground-level		
1991	(ESPOO) Convention on Environmental Impact Assessment in a Transboundary Context 2003 (KIEV) Protocol on Strategic Environmental Assessment		
1992	(HELSINKI) Convention on the Protection and Use of Transboundary Waters and 1999 (LONDON) Protocol on Water and Health 2003 (KIEV) Protocol on Civil Liability and Compensation for Damage Caused by the Transboundary Effects of Industrial Accidents on Transboundary Waters	2007	Ac
1992	(HELSINKI) Convention on the Transboundary Effects of Industrial Accidents		
1993	(OSLO and LUGANO) Convention - Civil Liability for Damage from Activities Dangerous for the Environment		
1994	(LISBON) Energy Charter Treaty 1994 (LISBON) Protocol on Energy Efficiency and Related Aspects 1998 Amendment to the Trade-Related Provisions of the Energy Charter Treaty	1995 1995	Ra Ra
1997	(NEW YORK) Convention on Non-navigatory Uses of International Watercourses	2007	Ac
1998	(AARHUS) Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters 2003 (KIEV) Protocol on Pollutant Release and Transfer Register		
1998	(STRASBOURG) Convention on the Protection of Environment through Criminal Law		
2000	(FLORENCE) European Landscape Convention		
2006	(SEMIPALATINSK) Treaty on a Nuclear-Weapon free Zone in Central Asia	2006	Ra

Ac = Accession; Ad = Adherence; At = Acceptance; De = Denounced; Si = Signed; Su = Succession; Ra = Ratification.

Air pollution (continued)		1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Emissions of persistent organic pollutants (PCBs, dioxin/furan and PAH)												
- Total (tons)												
- by sector (tons)												
Energy												
Industry												
Transport												
Other												
Emissions of heavy metals												
- Total cadmium (tons)												
- Total lead (tons)												
- Total mercury (tons)		2.5	3.5	1.9	1.3	0.2	3.4	3.2	2.6	3.6	2.5	
								0.008	0.001			
Greenhouse gas emissions (total of CO ₂ , CH ₄ , N ₂ O, CFC, etc.) expressed in CO ₂												
- Total (million tons)			160.6	201.2					199.8			
- by sector (thousand tons)												
Energy (burning of CO ₂ , CH ₄ , N ₂ O)				44,358.0					36,750.0			
Coal, oil and gas production (CH ₄)				70.2					76.5			
Industry (burning + industrial processes)				9,966.0					11,707.0			
Transport, including pipeline				11,179.0					9,631.0			
Agriculture (burning + intestinal fermentation + manure + soil emissions)				18,852.0					18,474.0			
Waste				4,531.9					4,691.1			
Other (burning of CO ₂ , CH ₄ , N ₂ O) (commercial + housing + other)				42,036.0					42,122.0			
Emissions of CO ₂												
- Total (million tons)		100.5	104.7	105.0					95.6			
- by sector (thousand tons)												
Energy		29,875.0	30,088.0	44,284.0	29,435.0	29,409.0	28,472.0	29,330.0	36,695.0	29,284.0		
Industry (burning + industrial processes)				8,572.0					10,098.0			
Transport, including pipeline				11,132.0					9,588.0			
Agriculture				2,693.0					2,024.0			
Waste												
Other (commercial + housing + other)				41,926.0					42,014.0			
- per capita (kg/capita)				4,400.0					3,800.0			
- per unit of GDP (kg/1,000 National currency units)												
Greenhouse gas (GHG) emissions vs. targets (if established) (% of the target)												
Urban population exposed to air quality exceedances												
- Number of exceedances of maximum allowable concentration (MAC) (times/year)												
- Air pollution index (% of population affected)												
Consumption of ozone-depleting substances (ODS) (tons)		121.7	100.2	43.9	18.1	0.8	2.5	1.8	3.8	4.2	0.2	2.3

Biodiversity and living resources										1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008		
Forests																						
- Total area (thousand ha)													1,717.2	1,745.5	1,751.1	1,782.0						
- Total area (% of national territory)																						
- Naturalness																						
Undisturbed by man (thousand ha)																						
Semi-natural (thousand ha)																						
Plantation (thousand ha)																						
- volume of the wood (thousand m ³)																						
- harvesting intensity (harvest/growth)																						
Number of endangered species (by IUCN Red List)																						
- Critically endangered																			67.0			
- Endangered																			47.0			
- Vulnerable																						
Industrial fish catch (tons)										88.7	8.2	8.7	8.8	7.8	5.4	4.6	5.1	6.6				
- From fish farming (tons)										6.1	5.5	5.3	5.4	5.2	3.3	2.4	2.8	3.3				
- From natural water bodies (tons)										2.7	2.7	3.4	3.4	2.6	2.1	2.2	2.3	3.3	3.1	3.8		
Land resources and soil										1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008		
Arable land (thousand ha)										4,077.0	4,061.9	4,056.6	4,056.2	4,052.7	4,042.7	4,049.0	4,057.2	4,064.2	4,068.6	4,071.2		
Cultivated land (thousand ha)										4,077.0	4,061.9	4,056.6	4,056.2	4,052.7	4,042.7	4,049.0	4,057.2	4,064.2	4,068.6	4,071.2		
Soil erosion													731.4	628.4	628.4	628.4	628.4	628.4	628.4			
- % of total land												1.64	1.64	1.41	1.41	1.41	1.41	1.41	1.41	1.41		
- % of agricultural land												2.73	2.73	2.43	2.44	2.44	2.44	2.48	2.48	2.48		
Fertiliser use per ha of cultivated land																						
- Mineral fertilizers (thousand tons/year)											586.7	551.2	511.5	563.5	533.2	520.6	470.1	462.4	447.5			
- Organic fertilizers (thousand tons/year)											4,400.1	3,307.2	3,203.0	3,996.2	2,622.2							
Pesticide use (kg/ha)																						
Energy										1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008		
Total primary energy supply (TPES) (Mtoe)																						
Total final energy consumption (TFC) (Mtoe)																						
- by fuel																						
Coal																						
Petroleum products																						
Natural gas																						
Electricity (million kWh)										38,310.8	38,523.5	39,466.5	37,934.4	38,297.4	37,523.5	37,629.0	36,699.1	39,417.0	40,623.3	40,737.5		
Heat supply (thousand Gcal)										23,286.2	21,563.9	21,838.9	15,963.1	10,770.9	10,593.6	10,324.4	9,776.6	9,816.7	9,640.3	9,043.9		
Other																						
- by sector																						
Industry (million kWh)										15,917.2	16,210.7	17,534.5	15,737.6	16,242.6	16,164.2	15,784.9	15,830.2	16,074.1	15,724.3	16,772.8		
Transport (million kWh)										1,155.7	1,149.8	1,219.8	1,226.3	1,211.1	1,181.4	1,304.9	1,353.4	1,299.5	1,253.7	1,264.3		
Agriculture (million kWh)										11,097.5	10,372.9	11,322.0	11,228.0	11,804.2	11,474.9	11,571.0	9,926.7	10,730.5	9,382.0	9,484.8		
Municipal consumption and construction (million kWh)										10,140.4	10,790.1	9,680.0	9,742.5	9,039.5	8,703.1	8,968.2	9,588.8	11,313.3	14,263.2	14,479.9		
Energy intensity TPES/GDP (PPP) (toe/thousand US\$ (2000) PPP)																						
Energy productivity GDP (PPP)/TPES (thousand US\$ (2000) PPP/toe)																						
TPES/Population (toe per capita)																						

Transportation											
Number of transport accidents (land, air and maritime)											
In which											
- Died											
- Injured											
Size and composition of motor vehicle fleet (1,000)											
Freight vehicle fleet (1,000)											
- Trucks											
Passenger vehicle fleet (1,000)											
- Buses (including passenger vans)											
- Cars											
Passenger transportation (million passenger)										4,652.4	5,264.7
Freight transportation (million ton)										879.3	965.9
Waste	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Generation of waste											
Total waste generation (tons)											
- Hazardous waste (if available, by class of hazard) (tons)											
Total: (ton/year)	26,438.9	26,985.1	14,446.7	27,710.3	31,365.3	33,107.4	35,727.5	40,318.3	38,571.4	40,260.4	
1st class (ton/year)	0.3	0.2	0.2	1.7	1.1	4.9	1.5	0.2	0.1	1.2	1.4
2nd class (ton/year)	6.0	5.2	5.7	5.7	8.5	7.6	2.8	4.1	3.5	9.9	7.3
3rd class (ton/year)	667.8	706.7	371.9	693.8	689.6	806.2	1,416.3	6,871.9	6,875.3	37,633.1	39,923.8
4th class (ton/year)	25,764.7	26,272.9	14,068.9	27,009.1	30,666.2	32,288.7	34,306.8	33,442.1	35,320.1	2,616.2	2,793.1
- Industrial waste (million tons)										100.0	100.0
- Municipal waste (tons)											
Domestic waste generation	9,510.0	8,970.0	7,519.0	5,842.0	5,392.0	4,643.5	5,189.7	3,436.6	4,344.5	3,639.0	4,201.8
- Radioactive (nuclear) waste (tons)											
Transboundary movements of hazardous waste (tons)											
Waste intensity (total waste generated per unit of GDP) (tons/1,000											
National currency units)											
Waste recycling and reuse (million tons)										20.0	20.0
Health and Demography	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Drinking water quality											
- Samples failing the standards on sanitary -chemical indicators (%)	24.8	19.1	16.6	19.4	16.3	15.9	16.3	18.9	11.7	15.9	15.8
- Samples failing the standards on microbiological indicators (%)	7.4	7.6	6.1	6.5	5.1	5.2	5.5	6.0	7.5	6.3	7.2
Population with access to safe drinking water (%)											
Population with access to improved sanitation (%)											
Incidence of typhoid, paratyphoid infections (per 100,000 population)											
typhoid	1.1	1.1	0.7	0.7	0.4	0.3	0.3	0.4	0.2	0.2	0.2
paratyphoid	0.2	0.1	0.1	0.1	0.07	0.09	0.06	0.08	0.05	0.05	0.05
Salmonella infections (per 100,000 population)	8.7	7.1	5.9	5.0	5.6	4.9	4.6	5.5	6.1	6.2	5.0
Tuberculosis incidence rate (per 100,000 population)	50.0	53.1	55.6	65.2	69.7	68.5	68.2	68.2	62.6	59.5	57.5
including with BK+	13.5	13.9	14.3	13.6	17.9	18.4	19.9	21.3	22.1	20.2	19.2
Viral hepatitis incidence rate (per 100,000 population)	236.3	157.4	233.0	158.9	131.3	114.9	145.9	115.8	112.9	125.3	117.5
viral hepatitis type A	206.4	126.3	200.0	133.6	111.5	99.9	132.2	105.0	104.0	118.7	113.2
viral hepatitis type B	99.9	27.6	29.4	23.2	18.5	13.7	11.6	8.8	7.3	5.1	3.4
Health expenditure (% of GDP)											
Birth rate (per 1000)									20.9	22.4	
Total fertility rate											
Mortality rate (per 1000)									5.3	5.2	
Infant mortality rate (deaths/1000 live births)			18.9	18.3	16.7	16.4	15.4		14.5	15.7	
Female life expectancy at birth (years)											

Income and poverty		1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
GDP per capita (US\$/capita)									544.7	651.9	827.4	1,018.5
Poverty												
- Population living below 50% of median income (%)												
Income inequality (Gini coefficient)												
Minimum to median wages (minimum wage as a percentage of median wage)												
Communications		1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Telephone lines per 100 population			6.60	6.80	6.70	6.70	6.80	6.80	6.90	6.90	6.90	6.90
Cellular subscribers per 100 population			0.30	0.40	0.50	0.70	1.30	2.10	4.40	10.20	21.70	45.90
Personal computer in use per 100 population												
Internet users per 100 population					0.55	1.08	1.91	2.59	3.25	6.38	7.44	8.97
Education		1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Literacy rate (%)								99.7	99.7	99.7	99.7	99.7
Education expenditure (% of the GDP)		7.4	9.6	9.4	8.4	8.9	8.3	7.9	8.5	8.5	8.7	9.4

Sources:

State Committee of the Republic of Uzbekistan for nature protection
Ministry of Agriculture and Water resources of the Republic of Uzbekistan
Ministry of Health of the Republic of Uzbekistan
Ministry of Public education of the Republic of Uzbekistan
State Committee of the Republic of Uzbekistan on Land resources, Geodesy, Cartography and State Cadastre
The Centre of Hydrometeorological Service under the Cabinet of Ministers of the Republic of Uzbekistan
State Joint-Stock Company "Uzbekenergo"
Communications and information Agency of Uzbekistan
The materials of the State Committee of the Republic of Uzbekistan on Statistics were used

Annex IV

***LIST OF MAJOR ENVIRONMENT-RELATED
LEGISLATION IN UZBEKISTAN***

1992

- Constitution of the Republic of Uzbekistan (No. 723-XII of 08.12.1992)
- Law on State Sanitary Supervision (No. 657-XII of 03.07.1992)
- Law on Nature Protection (No. 754-XII of 09.12.1992; last amended in 2006)

1993

- Law on Water and Water Use (No. 837-XII of 06.05.1993; last amended in 2007)
- Law on Local Government Bodies (No. 900-XII of 02.09.1993)
- Law on Standardization (No. 1002-XII of 28.12.1993; last amended in 2006)
- Law on Metrology (No. 1004-XII of 28.12.1993; last amended in 2003)
- Law on the Certification of Products and Services (No. 1006-XII of 28.12.1993; last amended in 2006)

1994

- Administrative Responsibility Code (No. 2015-XII of 22.09.1994; last amended in 2007)
- Criminal Code (No. 2012-XII of 22.09.1994; last amended in 2001)
- Code of Criminal Procedure (22.09.1994)

1995

- Labour Code (No. 162-I of 21.12.1995; last amended in 2005)
- Law on International Treaties (22.12.1995)
- Civil Code: Part I (21.12.1995)

1996

- Law on Ambient Air Protection (No. 354-I of 27.12.1996; last amended in 2006)
- Law on the Protection of Consumer Rights (No. 221-I of 26.04.1996; last amended in 2006)
- Civil Code: Part II (No. 257-I of 29.08.1996; last amended in 2004)
- Law on Public Health Protection (29.08.1996)

1997

- Law on the Rational Use of Energy (No. 412-I of 25.04.1997; last amended in 2007: No. 3PY-116)
- Law on the Protection and Use of Flora (No. 543-I of 26.12.1997; last amended in 2000)
- Law on the Protection and Use of Fauna (No. 545-I of 26.12.1997; last amended in 2000)
- Law on Geodesy and Cartography (No. 417-I of 25.04.1997)
- Law on Guarantees and Freedom of Access to Information (24.04.1997)
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- Housing Code (24.12.1998)
- Law on State Land Cadastre (No. 666-I of 28.08.1998; last amended in 2004)
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1999

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2000

- Law on the Approval of Certain Regulatory Acts on the Protection of Domestic Forests (No. 506 of 22.11.1999)
- Law on State Cadastres (No. 171-II of 15.12.2000; last amended in 2004)
- Law on Agricultural Pest Management (31.08.2000)
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- Law on the Courts (new edition) (14.12.2000)
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2004

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- Law on Protected Natural Areas (No. 710-II of 03.12.2004)
- Law on Improving the Regulation of Imports and Exports of Ozone-depleting Substances and Goods Containing them (No. 247 of 11.11.2004)
- Law on Amendments, Additions and Revocations of Certain Legislative Acts (No. 714-II of 03.12.2004)

2006

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- Law on the Courts of Arbitration (3PY-64 of 16.10.2006)

2007

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- Tax Code (25.12.2007)
- Law on the State Programme for Forecasting and Preventing Emergency Situations (No. 71 of 03.04.2007)

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2001

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- On the Reinforcement of Economic Reforms in the Energy Field

2003

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2005

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2006

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2007

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2008

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2009

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- On Activities for Streamlining the Use of Underground Waters and Enhancing their Protection from Pollution and Depletion (Resolution No. 179 of 08.04.1992)
- On Adoption of the Statute on Water Protection Zones of Water Reservoirs and other Water Sources, Rivers, Main Canals and Collectors, as well as Sources of Potable and Household Water Supply and Recreational and Medicinal Waters of the Republic of Uzbekistan (Resolution No. 174 of 07.04.1992; last amended in 2003)

1993

- On Enhancing the Protection of Valuable and Endangered Plant and Animal Species and Streamlining their Utilization (*Oliy Majlis* Resolution No. 937-XII of 03.09.1993)
- On Adoption of Statute on Nature Protection Funds (Resolution No. 246 of 24.05.1993)
- Invalidation of and Amendments to the Decisions of the Government of the Republic of Uzbekistan due to the Adoption of the Law of the Republic of Uzbekistan on Nature Protection (Resolution No. 436 of 30.08.1993; last amended in 2004)
- On Limited Water Use (Resolution No. 385 of 03.08.1993; last amended in 2004)

1996

- On Adoption of the Statute of the State Committee for Nature Protection of the Republic of Uzbekistan (*Oliy Majlis* Resolution No. 232-I of 26.04.1996; last amended in 2003)

1997

- On Adoption of the Regulatory Acts in Accordance with the Law on Subsoil (Resolution No. 20 of 13.01.1997; last amended in 2004)
- On the National Programme on Raising Public Legal Awareness (*Oliy Majlis* Resolution of 29.08.1997)
- On the Commission on Sustainable Development of the Republic of Uzbekistan (Resolution No. 510 of 12.11.1997)
- On the State System for the Prevention of and Response to Emergency Situations (Resolution No. 558 of 23.12.1997)

1998

- On Adoption of the Statute on Water Protection Areas and Protection of Geodesic Facilities within the Territory of the Republic of Uzbekistan (Resolution No. 69 of 16.02.1998; amended in 2005)
- On Adoption of the Regulations on the Procedures for the Development and Maintenance of the State Water Cadastre of the Republic of Uzbekistan (Resolution No. 11 of 07.01.1998; last amended in 2004)

1999

- On Adoption of Certain Regulatory Acts on the Protection of Domestic Forests (Resolution no. 506 of 22.10.1999)
- On Maintenance of the State Land Cadastre (Resolution No. 278 of 30.06.1999)
- On Privatization in 2001–2002 (Resolution No. 511 of 26.11. 999)

2000

- On Reorganization of the Commission on the Sustainable Development of the Republic of Uzbekistan (Resolution No. 359 of 19.11.2000)
- Measures to Observe the International Commitments of the Republic of Uzbekistan under Agreements on the Protection of the Ozone Layer (Resolution No. 20 of 24.01.2000; last amended in 2005)
- On Regulating Imports and Exports of Ozone-depleting Substances and Products Containing them in the Republic of Uzbekistan (Resolution No. 90 of 14.03.2000)
- On Regulating Imports and Exports of Environmentally Hazardous Products and Waste in the Republic of Uzbekistan (Resolution No. 151 of 19.04.2000; last amended in 2003)
- On the Adoption of the Regulations on the State Cadastre of the Flora of the Republic of Uzbekistan and the Regulations on the State Cadastre of the Fauna of the Republic of Uzbekistan (Resolution No. 343 of 05.09.2000; last amended in 2005)
- On Issues concerning the Implementation of the National Environmental Action Plan of the Republic of Uzbekistan for 1999–2005 (Resolution No. 389 of 09.10.2000)
- On Streamlining the Activities of Enterprises in the Utilization and Disposal of Mercury-containing Lamps and Devices (Resolution No. 405 of 23.10.2000)
- On the Adoption of the Regulations on Land Monitoring (Resolution No. 496 of 23.12.2000; last amended in 2004)

2001

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- On Improvement in the Environmental and Sanitary and Epidemiological Situation in the Zarafshan River Basin (Resolution No. 401 of 04.10.2001)
- On the Adoption of the Statute of the Ugam-Chatkal State National Park, Chatkal Biosphere Reserve, and Akhangaran and Burchmulla Forestry Enterprises (Resolution No. 262 of 22.06.2001)
- On the Adoption of the Regulations on State Ecological Expertise in the Republic of Uzbekistan (Resolution No. 491 of 31.12.2001; amended in 2005)

2002

- On State Regulation of the Transit of Special Cargo and Military Units through the Territory of the Republic of Uzbekistan (Resolution No. 62 of 21.02.2002; last amended in 2005)
- On the Adoption of the Regulations on State Environmental Monitoring in the Republic of Uzbekistan (Resolution No. 111 of 03.04.2002; last amended in 2004)
- On Awarding Strictly Protected Area Status to the Formation Zones of the Chirchik, Akhangaran, Surhandarya, Chimgan-Avual Fresh Groundwater Sources (Resolution No. 23 of 16.01.2002; amended in 2005)
- On Establishment of the Water Protection Zone and Riverside Strip of the Kashkadarya River in the Kashkadarya Region (Resolution No. 80 of 06.03.2002)
- On the Programme of Coal Industry Development for 2002–2010 (Resolution No. 1964 of June 2002)

2003

- On Measures to Improve Guaranteed Water Supply and Rational Utilization of Water Resources of the Syr Darya River (Resolution No. 46 of 25.01.2003)
- On the Improvement of the System of Payments for Environmental Pollution and Waste Disposal in the Territory of the Republic of Uzbekistan (Resolution No. 199 of 01.05.2003; last amended in 2006)
- On the Improvement of Water Management Institutions (Resolution No. 320 of 21.07.2003)
- On Measures to Enhance Demonopolization and Privatization in the Fishing Industry (Resolution No. 350 of 13.08.2003; amended in 2004)
- On the Procedure for Coordinating checks by enforcement authorities of commercial legal entities (Decision of the National Council for the Coordination of Enforcement and Control of 11.03.2003 No. 06-01-01)
- Execution of the Cabinet of Ministers Resolution No. 401 dd. of 03.10.2001 (Order No. 38 dd. of the State Committee for Nature Protection of 12.05.2003 on a Comprehensive System of Monitoring River Water Quality and Pollution Sources within the Samarkand, Navoi and Bukhara regions)
- On Improvement of the Activities of the Ministry of Agriculture and Water Management (Resolution No. 290)
- On the Adoption of the Environmental Monitoring Programme of the Republic of Uzbekistan for 2003–2005 (Resolution No. 16)
- On the Approval of Regulations on the Use of Electrical and Thermal Power

2004

- On Measures to Complete the Construction of the Chorvok Oromgohi Resort in the Chimgan Charvak Recreation Area (Resolution No. 10 of 10.01.2004)
- On Streamlining the Use of Grants (Resolution No. 56)
- On Measures to Prevent and Eliminate Consequences in Secure Run-off of Flood Water and Mudflows (Resolution No. 117 of 10.03.2004)
- On the Establishment of a Charity Foundation for the Protection of the Gene Pool of the Territories adjacent to the Aral Sea (Resolution No. 162 of 03.04.2004)
- On Establishment of Water Protection Zone and Riverside Strip of the Kara Darya River in the Andijan and Namangan Regions (Resolution No. 178 of 13.04.004)
- On the Establishment of Water Protection Zone and Riverside Strip of the Naryn River in Namangan Region (Resolution No. 179 of 13.04.2004)
- On the Improvement of the Hydrometeorological Service of the Republic of Uzbekistan (Resolution No. 183 of 14.04.2004)
- On Additional Measures to Streamline the Procedure for Product Certification (Resolution No. 318 of 06.07.2004)
- On Measures to Streamline Deductions to the Off-budget Funds of Ministries and Agencies (Resolution No. 499 of 25.10.2004; amended in 2004)
- On the Enhancement of Oversight of the Rational Use of Biological Resources and their Imports and Exports in the Republic of Uzbekistan (Resolution No. 508 of 28.10.2004)

2005

- On Amendments of selected Governmental Decisions (Resolution No. 95 of 01.04.2005)
- On Improvements to the Regulation of the Import into and Export from the Republic of Uzbekistan of Ozone-depleting Substances (Resolution No. 247 of 11.10.2005)
- On the Adoption of the Regulations on the Procedure to Prepare State Cadastres (Resolution No. 250 of 15.11.2005)
- On the Procedure of Application of the Compensation Payments for Environmental Pollution and Waste Disposal (Resolution No. 126 of 18.05.2005)
- On the Adoption of the Regulations on Strengthening the Control of the Rational Use of Biological Resources Imported and Exported to and from Uzbekistan (Resolution No. 508 of 28.10.2005)
- On the Adoption of the Regulations on State Geodesy Inspectorate under the State Committee on Land Resources, Geodesy, Cartography and Land Cadastre, on State Control over the Use and Protection of Land, and on the Procedure of Establishing and Maintaining the State Cadastres System (Resolution No. 66 of 16.02.2005)

2006

- On Measures to Develop the Interaction of State and Economic Management Bodies with the General Public (Resolution No. 203 of 22.09.2006)
- On Adoption of the Regulation on the Procedure of Conducting Checks of Economic Entities and the Registration of Checks (Order of the Ministry of Justice No. 213-mkh of 29.12.2006)
- On the Improvement of the System of Payments for Special Nature Use (Resolution No. 15 of 06.02.2006)
- On Instructions on Carrying out Inventories of the Sources of Pollution and Establishing the Norms of Discharging Pollutants into the Air for Enterprises (Order No. 105 of the State Committee for Nature Protection, registered by the Ministry of Justice on 03.01.2006 (No. 1533))
- On the Procedure of Privatization of Objects of State Property (Resolution No. 145)
- On the Order of Preparation and Adoption of Government Plans for Legislative Work and for Monitoring the Execution of the Resolutions of the Cabinet of Ministers (Resolution No. 84 dd of 15.05.2006)
- On Measures for the Realization of Investment Projects in the Framework of the Interdepartmental Council on the Clean Development Mechanism of the Kyoto Protocol (Resolution No. 525)
- On Approval of the Programme for Monitoring the Environment for 2006–2010 (Resolution No. 48 dd. of 16.03.2006)

2007

- On Measures for Further Interaction of Public and State Economic Management Bodies and Local Public Authorities with Legal and Natural Persons using Information and Communication Technologies (Resolution No. 181 of 23.08.2007)
- On adoption of the Regulation on the Procedure for Organizing Checks of Individual Entrepreneurs by Enforcement Authorities (Decision of the National Council for the Coordination of Enforcement and Control No. 1 of 23.08.2007)
- Cabinet of Ministers Resolution on the Approval of the Regulations for the Development and Implementation of the Investment Projects in the Framework of the Clean Development Mechanism of the Kyoto Protocol (Resolution No. 9)

2008

- Regulation for Forest Protection (09.09 2008)

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1997

- National Sustainable Development Strategy

1998

- National Environmental Action Plan of the Republic of Uzbekistan for 1999–2005
- National Biodiversity Strategy and Action Plan (Resolution No. 139 of 01.04.1998; amended in 2000)
- Programme for Environmental Protection and the Rational Use of Natural Resources for 1999–2005

1999

- National Environmental Health Action Plan
- National Action Programme to Combat Desertification

2000

- National Programme on the Development of Irrigation for 2000–2005
- State Programme on Providing the Rural Population with Drinking Water and Natural Gas for the Period 2000–2010
- National Strategy on Greenhouse Gas Emissions Reduction

2001

- Strategy for the Development of the Irrigation and Drainage Sector
- Programme of Electric Power Generation up to the Year 2010

2002

- Concept of Integrated Sustainable Water Supply
- Programme on Energy Efficiency
- Programme of Coal Industry Development for 2002–2010

2003

- Environmental Monitoring Programme of the Republic of Uzbekistan for 2003–2005 (Resolution No. 16 of 13.01.2003)

2004

- Living Standards Improvement Strategy for the Population of Uzbekistan 2004–2006 and up to 2010

2005

- Concept of Geological Surveying for Oil and Gas for 2005–2010

2006

- Programme for Monitoring the Environment for 2006–2010 (Resolution No. 48 of 16.03.2006)
- National Forest Programme

2007

- State Programme for Foreseeing and Preventing Emergency Situations
- Privatization Programme for 2007–2010
- Welfare Improvement Strategy for 2008–2010
- Programme on the Technical and Technological Modernization of Facilities for the Production of Construction Materials for 2007–2011
- Programme on Energy Saving in the Oil and Gas Sector for 2007–2012

2008

- Programme of Actions on Nature Protection for 2008–2012 (Resolution No. 212 of 19.09.2008)
- State Programme for the Amelioration and Improvement of Irrigated Lands for 2008–2012 (Resolution No. 817 of 19.03.2008)
- Anti-recessionary Programme

2009

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