

KAZAKHSTAN

COUNTRY ENVIRONMENTAL ANALYSIS



Asian Development Bank

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PREFACE

The present volume brings to a wider audience some of the analysis behind the country strategies and assistance programs that the Asian Development Bank (ADB) formulates in consultation with its member countries. The focus of the document is environmental management, one of ADB's priority concerns not diminished by the more forceful and explicit attention given in recent years to poverty alleviation.

Leaving aside the People's Republic of China, ADB member countries under the responsibility of the East and Central Asia Department (ECRD) include "textbook" transition economies, six out of seven of them countries of the former Soviet Union (FSU). This amounts to unique opportunities for ADB to influence for the better the course of economic and social development in these fledgling market economies.

ADB's support for environmental management in FSU member countries is not new as the present document explains in detail. Earlier ADB publications devoted to the same broad subject matter in the ECRD region include *Central Asian Environments in Transition* (1997), *Environmental Profile of Tajikistan* (2001), and *Mongolia's Environment: Implications for ADB's Operations* (2002). The present report dealing with Kazakhstan adds to them and to the considerable body of detailed unpublished material used by ADB staff.

This document is one of the outputs of the regional technical assistance for Central Asian republics for Integrating Environmental Considerations into Development Policies, Plans, and Programs.

ADB wishes to record its gratitude to Kazakhstan's Ministry of Environmental Protection and Ministry of Economy and Budget Planning for the support given to the process of country environmental analysis on which this document rests. Several other government agencies shared their views and experience and even if they are not listed one by one here, their importance in a project dealing with integration of environmental with other concerns is obvious. Extensive feedback was also obtained from Kazakhstan's nongovernment organizations and ADB is encouraged by the degree of interest in the subject and their participation in the process.

East and Central Asia Department
Asian Development Bank
June 2004

CURRENCY EQUIVALENTS

(as of June 2004)

Currency Unit	–	tenge (T)
T1.00	=	\$0.0073
\$1.00	=	T136.5600

ABBREVIATIONS

ADB	–	Asian Development Bank
AOTA	–	advisory and operation technical assistance
APCED	–	Asia-Pacific Conference on Environment and Sustainable Development
ASB	–	Aral Sea Basin
ASP	–	Agency of Strategic Planning
BTO	–	best available technology
BVO	–	river basin authority (from Russian)
CA	–	Central Asia
CAMIN	–	Central Asian Mountain Information Network
CARs	–	Central Asia republics
CAREC	–	see REC-CA
CARECU	–	Central Asia Regional Economic Cooperation Unit (of ECOC)
CBO	–	community-based organization
CEA	–	Country Environmental Analysis
CERCLA	–	Comprehensive Environmental Response, Compensation and Liability Act (U.S.)
CP	–	clean production
CSP	–	Country Strategy and Program
DMC	–	Developing Member Country (of ADB)
ECAE	–	Agriculture, Environment and Natural Resource Division of CEAD (of ADB)
ECID	–	Infrastructure Division (of ECRD)
ECOC	–	Operations Coordination Division of CEAD (of ADB)
ECRD	–	East and Central Asia Department (of ADB)
EDD	–	environmental due diligence
EPIC	–	Environmental Policies and Institutions of Central Asia
ESCAP	–	Economic and Social Commission for Asia and the Pacific
EU	–	European Union
FSU	–	Former Soviet Union
GDP	–	gross domestic product
GEF	–	Global Environment Facility
GGERI	–	Greenhouse Gas Emissions Reduction Initiative
GM	–	Global Mechanism of the UNCCD
GOK	–	Government of Kazakhstan
GWP	–	Global Water Partnership
HDI	–	Human Development Index
ICAS	–	Interstate Council for the Aral Sea (merged into IFAS)
ICCW RM	–	Interstate Commission for the Coordination of Water Resource Management (see also ICWC)
ICIMOD	–	International Center for Integrated Mountain Development
ICSD	–	Interstate Commission for Sustainable Development

ICWC	–	Interstate Commission for Water Coordination (see also ICCWRM)
IDCCD	–	Inter-Departmental Committee to Combat Desertification
IFAS	–	International Fund for Saving the Aral Sea
IFI	–	international financial institutions
ISO	–	International Standards Organization
IZA	–	index of air pollution (used in NIS, from Russian)
IZV	–	index of water pollution (used in NIS, from Russian)
JFPR	–	Japan Fund for Poverty Reduction
KAZ	–	Kazakhstan
KYR	–	Kyrgyz Republic
LEAP	–	local environmental action plan
MEAs	–	multilateral environmental agreements
MEBP	–	Ministry of Economy and Budget Planning
MEMR	–	Ministry of Energy and Mineral Resources
MOA	–	Ministry of Agriculture
MOU	–	memorandum of understanding
MPC	–	maximum permitted concentrations
NAPCD	–	National Action Program to Combat Desertification
NFP	–	National Focal Point
NEAP	–	National Environmental Action Plan
NGO	–	nongovernment organization
NIS	–	Newly Independent States
NR	–	natural resources
OECD	–	Organization for Economic Cooperation and Development
OSCE	–	Organization for Security and Cooperation in Europe
PIP	–	Public Investment Plan
PPP	–	purchasing-price parity
PPTA	–	Project Preparation Technical Assistance
PRC	–	People's Republic of China
PRPA	–	Poverty Reduction Partnership Agreement
PREGA	–	Promotion of Renewable Energy, Energy Efficiency and Greenhouse Gas Abatement Projects
RAP	–	Regional Action Program under UNCCD
REAP	–	Regional Environmental Action Plan
REC-CA	–	Regional Environmental Center for Central Asia
RETA	–	Regional Technical Assistance
ROK	–	Republic of Kazakhstan
RSAN	–	Agriculture, Environment and Natural Resource Division (of RSSD)
RSES	–	Environment and Social Safeguard Division (of RSSD)
RSSD	–	Regional Sustainable Development Department (of ADB)
SD	–	sustainable development
SIC	–	Scientific Information Center
SME	–	small and medium enterprise
SPA	–	Strategic Partnership Agreement
SPECA	–	Special Program for the Economies of Central Asia
SRAP	–	Sub-regional Action Program under UNCCD
TA	–	Technical Assistance
TACIS	–	Technical Assistance for the Commonwealth of Independent States
UNCCD	–	United Nations Convention to Combat Desertification and Drought
UNDP	–	United Nations Development Program
UNECE	–	United Nations Economic Commission for Europe

UNEMS	–	Unified National Environmental Monitoring System
UNEP	–	United Nations Environment Program
USAID	–	United States Agency for International Development
WARMAP	–	Water Resource Management and Agriculture Production (Project)
WARMIS	–	Water Resource Management Information System
WB	–	World Bank
WRC	–	Water Resource Commission
WSSD	–	World Summit on Sustainable Development

GLOSSARY

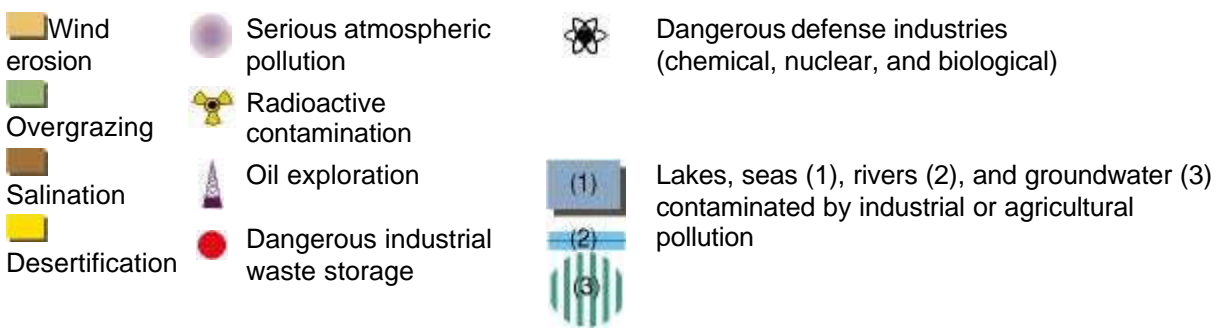
<i>akimat</i>	local government, headed by an <i>akim</i>
<i>kolkhoz</i>	agricultural cooperative (during Soviet times)
<i>oblast</i>	Province (16 of them in Kazakhstan, including the cities of Almaty and Astana)
<i>rayon</i>	District (160 of them in Kazakhstan)
<i>sovkhoz</i>	state farm (during Soviet times)

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Map 1: Chief Environmental Problems In Central Asia

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Source: ?????????? *Le Monde diplomatique*, June 2000.

EXECUTIVE SUMMARY

The Country Environmental Analysis (CEA) of Kazakhstan presented here is one of several technical documents underpinning the preparation of Asian Development Bank's (ADB's) Kazakhstan country strategy and program (CSP) for 2004–2006. In addition, the CEA aims to provide a succinct, yet comprehensive, picture of the main environmental challenges that Kazakhstan faces and the responses to them.

More than a decade after Kazakhstan's independence, it is increasingly questionable whether the menu of environmental challenges confronting the country today can still be explained simply as a carry-over of the Soviet era's pattern of economic development. The path of economic transition since then has created its own environmental problems, as well as successes.

A broad consensus exists concerning the principal environmental concerns. They are

1. Existing conditions of water resources and their management, dominated by multiple problems associated with the decline of the Aral Sea but extending to inefficient use of water in general, water and groundwater contamination, under-investment in associated physical infrastructure, and water underpricing.
2. Degradation and poor management of land, in part linked to inefficient use of irrigation water but also as a result of inappropriate land use and farm practices, the problems compounded by deforestation in some areas.
3. Energy inefficiency and associated air pollution. Growing mobile source pollution in Almaty.
4. Inadequate waste disposal both municipal and industrial, with a legacy of accumulated waste, some toxic, and poorly defined policies to counter the problem.
5. Pressure, some of it recent, on the country's biodiversity and under-funding of the protected realm.
6. Unresolved issues of regional environmental cooperation, especially the management of transboundary water resources and its linkage with the pattern of energy supplies and trade in Central Asia and beyond.

Sound environment and sustainable development have official backing and ministerial status. Key Government documents outlining medium- and long-term strategy of economic development up to 2030 have been translated by the environmental authorities into more specific programs of work and action plans, but translated weakly, without a solid analytical and economic basis. Several strategies and plans for sectors with significant linkages to environmental management have also been prepared but a cross-sectoral approach to dealing with environmental issues remains under-developed or absent. Environmental concerns remain insufficiently integrated into the economic mainstream.

Kazakhstan has been an active participant in international and regional environmental initiatives and signatory of the principal international environmental conventions. This is strongly positive. At the same time, the scale of international and regional environmental commitments has probably outrun the institutional capacity of the Government to meet them without continued reliance on outside funding. The priorities identified under regional initiatives have not always matched national environmental policies and programs. New institutions and mechanisms

created to meet regional and international environmental demands have added to administrative complexity.

Soviet-era environmental legislation has been in part revised and further legal and regulatory instruments are being drafted. These are, or promise to be, important improvements. Nevertheless, the resulting structure is complex as new legislation coexists in some cases with old regulatory provisions. There are inconsistencies, overlaps, grey areas and gaps in coverage. Environmental decision-making is highly centralized in Kazakhstan for now. The capacity to formulate environment-oriented projects and programs at the local level is invariably weak, the local activities dominated by industry monitoring and the administration of pollution permit and pollution charge provisions. Under existing system of environmental financing, environment-related expenditure by the Government is out of line with stated environmental priorities. Reforms in this area are expected in line with greater decentralization in general.

Among steps that would merit consideration to deal with existing weaknesses are (i) a revision of several strategic documents such as the National Environmental Action Plan to strengthen their analytical and economic foundations; (ii) greater attention to estimating and articulating the economic and administrative benefits (and costs) of a cross-sectoral way of tackling environmental issues; (iii) willingness to return to major issues of environmental policy for now largely papered over (e.g., resource pricing); (iv) in concert with the Government's program of decentralization, a reform of the financing of environmental management; (v) linked with the above, strengthening of the local capacity to develop programs and projects that capture a variety of environmental or cross-sectoral synergies; (vi) better screening and greater selectivity of Agenda 21 activities; (vii) more efficient deployment of Ministry of Environmental Protection (MEP) staff linked to a simplification of environmental regulations, especially the administration of pollution charges; (viii) streamlining of regional and subregional environmental programs to reduce duplication and management workload (ix) reform of environmental data gathering and processing, based on demonstrated demand and usefulness.

Kazakhstan has actively cooperated with the international donor and financial community including ADB. In ADB's lending to Kazakhstan so far, environmental concerns have been addressed through safeguard provisions such as environmental impact assessments (EIAs), and through projects or programs in sectors with significant environmental linkages (agriculture, water supply, and energy), rather than through projects that would have environment as an explicit thematic objective. Both of these directions retain their validity. ADB's medium-term investment program should emphasize sustainable utilization of natural resources especially water. Other worthwhile investment opportunities exist.

ADB's environment-related technical assistance (TA) so far has targeted capacity building at the ministerial level, selected environmental or natural resources management problems as well as regional cooperation in environmental matters. The results have been mixed or disappointing in part because TA design tended to be ADB-driven, lessening the sense of local ownership, or because it was not based on a broad enough prior consultation among various domestic stakeholders. Also, a project-based approach prevailed over a programmatic approach, the latter more appropriate for Kazakhstan *a priori* as well as in retrospect. Corresponding modifications of approach to future technical assistance are called for, with environmental mainstreaming given prominence.

I. INTRODUCTION

1. The Asian Development Bank's (ADB's) revised business practices place emphasis on the preparation of upstream sector road maps and thematic analyses as fundamental elements of a sound country strategy formulation. Country Environmental Analyses (CEAs) provide the background necessary for informed decision making on environmental constraints, needs and opportunities in the country concerned. CEA is an input into the Country Strategy and Program (CSP). It is initiated ahead of the CSP and continues throughout CSP's preparation and finalization. The current document, the first CEA prepared for Kazakhstan, is a component of the 2003 CSP for that country.

2. It is advisable therefore to consider this document jointly with the now finalized Country Strategy and Program¹ in order better to appreciate the way in which environment-related considerations make their way into ADB operations. That process is rarely straightforward and typically calls for some compromises along the way. While the principal objective of better integrating environmental considerations into ADB's core mission of poverty alleviation is not in doubt² the manner in which this is accomplished can legitimately be debated. Not only is each Central Asian country different in terms of socio-economic and physical features, demanding sensitivity to the local context, but other considerations exist that will have a bearing on how many of the concerns and priorities identified in CEA are translated into investment or technical support, and how this support is structured. The reader is referred to the CSP document itself for the discussion of the macroeconomic setting and sectoral fit. Appendix D of this document limits itself to listing the loan and technical assistance projects representing the 2004–2006 assistance program.

3. Worth highlighting is that in the case of Kazakhstan, environmentally sustainable development ended up being one of CSP's four stated strategic priorities (together with pro-poor growth, improved human development, and greater regional economic linkages). Each of the strategic priorities is to be pursued through a combination of sectoral and other interventions. To put it differently, achievement of strategic priorities demands integration and coordination across sectors. In the CSP, the strategic priority assigned to sustainability is translated into action mainly via (a) a follow up on work already done through advisory TAs and RETAs in environment management combined with a shift from a project-based to program-based approach; and (b) support for improved management of water resources considered of major environmental importance. There is, however, much more to the choice of CSP final investment candidates and indeed the design of each ensuing loan and technical assistance project as the subsequent text seeks to show.

II. THE BACKGROUND

A. Overview: Environmental Strategy in Support of Economic Development

4. Kazakhstan is by far the largest of the countries of Central Asia (2.7 mil km²) but not the most populous. The country's relatively small and still declining population of under 15 million combines with considerable mineral wealth and land resources to constitute a remarkable potential for future prosperity. Kazakhstan's hydrocarbon resources are of global importance. At the same time, a significant portion of the natural endowment has been degraded and continues

¹ *Kazakhstan: Country Strategy and Program 2004-2006*, approved on 20 October 2003, Doc. M87-03.

² Witness the ADB-Government of Kazakhstan Poverty Reduction Partnership Agreement (PRPA) of 2003.

to be under threat from a variety of mostly man-made causes. The environmental stresses are unequally distributed. As a broad generalization, Eastern Kazakhstan is responsible for most mine tailings and industrial solid waste produced each year in Kazakhstan. The Republic's Caspian littoral is polluted with oil, while its central and southern regions face water pollution, soil degradation and desertification (see Map 1 above). The underlying vulnerability of Kazakhstan's steppe and semi-desert environment increases the pressures caused by resource mismanagement. Despite access to the Caspian Sea and the "Silk Road" heritage, Kazakhstan's location far from the main international transport routes remains an important economic drawback. The geography, climate and existing political boundaries have made environmental management in Kazakhstan unusually dependent on the country's neighbors, especially in the case of water resources. Any lasting improvements in the sustainability of economic activities in Kazakhstan require a strengthened framework and practices of regional collaboration and conflict resolution.

5. From the former Soviet days, the country has inherited important but energy-inefficient and polluting metal processing and other manufacturing, and labor force skilled technically and scientifically but lacking experience of market economy and its regulation. As in most other Newly Independent States (NIS), the collapse of collectivized agriculture was fast, resulting in complex repercussions ranging from a changed pattern of land use, irrigation water supplies, demographic change and increase in rural poverty.

6. Kazakhstan's vast area and very low population density (just over 5 people per sq km) are a unique challenge to economic development and environmental management. The disadvantages for socio-economic development of low population density were partly overcome during the Soviet days through a "one-company-town" strategy. This concentrated a significant percentage of population in seats of specialized industrial production subordinated to the supply arrangements of planned economy while making it possible to lower the cost of social service provision there. The policy made the "one-company" towns extremely vulnerable to the disruption of supply arrangements that followed the once unimaginable independence of the country. However, it rightly recognized the advantages –indeed necessity– of population clustering for achieving social development objectives. The situation in post-independence Kazakhstan has pushed the subject back to the forefront of policy debate. The main reason is the massive impoverishment of rural areas: While the percentage of rural population in Kazakhstan has remained stable since 1990 at around 44% of the total, the share of agriculture in GDP has fallen from 34 to 8 per cent of a declining (until recently) GDP. An ownership revolution in the countryside has transferred most of housing and many production assets into private ownership and reduced the ability of the Government directly to influence the pattern of population distribution. Former transport and other subsidies to scattered *kolkhoz/sovkhos* settlements –their true magnitude obscured by the system of administered prices -- that helped even out the rural-urban differentials in living standards during Soviet times have largely gone. The dismantling of the old regimented production structures in the countryside bodes well for ultimate increases of production efficiency but not necessarily for improvements in social service provision. In a sparsely populated country, such improvements will remain costly and will call for a policy supportive of the emergence of larger and more viable settlements in the countryside. In terms of environmental impacts, the developments sketched above have resulted in a number of new impacts such as different patterns of overgrazing, greater pressure on the environmental commons, and a necessity to create different economic and voluntary mechanisms of allocating water for which local administrations were originally not prepared. In general, environmental policy increasingly needs to anticipate and respond to a spatial pattern of economic activities driven not mainly by decree but also by market forces.

7. The environmental deterioration that served as one of the rallying cries for political reform in the late 1980s has outlasted the profound political changes of 1991 even as its causes and incidence have been changing. The old-style emphasis on production-growth-at-any-cost has largely gone and there have been improvements in Kazakhstan in some environmental indicators such as intensity of pollution (emissions per unit of real GDP) or energy efficiency (energy consumption per unit of GDP)³ suggesting that new growth is not the same as the old growth. Rapid adoption of global environmental perceptions, expectations and vocabulary has been translated into a new structure of environment-related legislation better suited to new institutional circumstances. However, by themselves, these have been insufficient to produce the results initially expected. The government's commitment to environmentally sustainable development has at times come into conflict with pressing short-term livelihood and income-related issues. The gap between stated environmental objectives and the financial resources mobilized remains large and mechanisms of bridging this gap not systematically addressed. The willingness and ability of the local population to pay for environmental improvements is lower than originally assumed. A number of policy and institutional issues have not been adequately addressed and institutional capacity remains weak especially at local levels. Despite much useful work carried out in the last decade, sustainable development is not fully integrated into the operation of the government as a whole, in all sectors and at all levels.

8. The view that environmental safeguards are more of an obstacle to economic growth and something to be discussed separately from economic matters remains common in Kazakhstan. Part of the explanation lies in the nature of environmental costs and benefits that have indirect and delayed repercussions on budgets (that speak louder than complex impacts of environmental changes on health). Billions of tenge's worth of, say, lost soil productivity fail to "impress" administrations because the impacts will be felt by future budgets, not the current ones. Furthermore, there is lack of appreciation of the fact that at any point of time, the structure of budgets reflects also the record of past environmental management. Health or agriculture expenditure *now* needs to be high because of the impact of *past* pollution on health or *past* water mismanagement on farm productivity. A significant portion of the social expenditure borne by the State now is in fact a payment for past and continuing environmental degradation.⁴ Without adequate environmental safeguards, economic activities may generate more jobs, personal incomes and greater government revenues but they will simultaneously require greater social expenditure and defensive spending by individuals to compensate for environmental impacts. Bottled water as a substitute for reliable supplies of potable piped water is hardly economic progress. Little attempt has been made in Kazakhstan to analyze official growth and budget data in these terms and draw appropriate conclusions.⁵

³ Available data can easily be re-cast in terms of such indicators despite the absence of such habit in Kazakhstan so far. Appendix E contains selected environmental indicators.

⁴ Payment of a special subsidy to the population within the Aral Sea environmental disaster area is perhaps the most telling illustration of this link and its budget repercussions.

⁵ In 2001, the Government's total social expenditure amounted to about a third of the total budget of approximately \$5 billion. A part of this amount was intended to fight poverty, acknowledged in Kazakhstan to be closely correlated with the environmental status. The nature of the link is complex and would deserve to be better quantified but nobody in Kazakhstan disputes its existence. Assume one third of total social expenditure in Kazakhstan to be due to past and current environmental degradation. If so, the spending to mitigate the environmental consequences of growth amounts to about 8% of GDP in that year (\$21 billion). Considering that existing levels of social expenditure are agreed to be too low to compensate for the slide into poverty, the true cost of past and current environmental degradation is higher still. The obvious route to generating greater support for environmental management and its financing in Kazakhstan is by documenting its current budget repercussions rather than mainly by an appeal to impacts that will be felt in the future.

B. Principal Environmental Concerns

9. For broad policy-setting purposes, adequate information exists about the nature and magnitude of principal environmental problems. ADB (1997), UN ECE (1991), Puri (2003) as well as the principal environmental plans (NEAP, REAP) provide the necessary summaries. In addition, statistical compendia are available such as *Environmental Statistics* (2001) or monthly monitoring reports of KAZHYDROMET. In what follows in Part I, the intent is not to compete with this material but to provide a handy summary and ADB's interpretation of the principal trends. Appendix E summarizes the most telling of the available environment-related data.

1. Water Resources: General

10. Because of Kazakhstan's location and climate, water and its management are of fundamental importance to the country's economic life. Water quantity and quality head most existing lists of environmental concerns in Kazakhstan. Despite being home to the Caspian and Aral seas and the Balkhash Lake, Kazakhstan shares with Uzbekistan and Turkmenistan the distinction of being among the most water-deficient of the NISs. About half of the water consumed in Kazakhstan is derived from trans-boundary water inflows from Kyrgyzstan, Tajikistan, and the Xinjiang province of China. With the collapse of the USSR, the formerly centralized system of water resource management fragmented, leaving the five newly independent states of Central Asia including Kazakhstan vulnerable to conflicts over shared surface water resources. Water management in the region is strongly influenced by the pattern of hydroelectricity production in the upper catchments.

Table 1. Use of water for agriculture, Central Asia, 1990–2001

Central Asia Republic	1990		2001	
	Water diverted for agriculture (mil m ³)	Irrigated area ⁶ ('000 ha)	Water diverted for agriculture (mil m ³)	Irrigated area ⁶ ('000 ha)
KAZ	10,136	781.8	786.0	786.0
KYR	4,587	423.7	415.0	415.0
UZB	54,634	4,185.5	4,259.0	4,259.0
TAJ	10,519	713.8	718.0	718.0
TURK	22,142	1,329.2	1,860.0	1,860.0

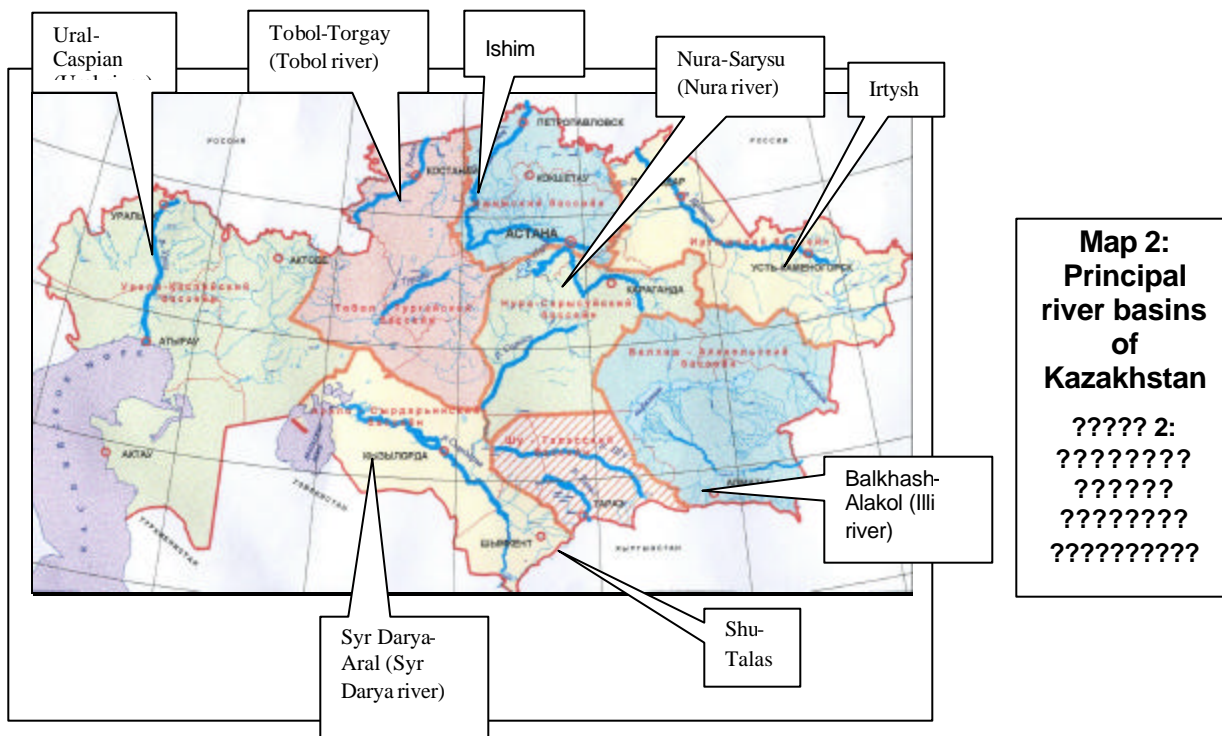
Source: WARMAP, GEF. Quoted in Le Moigne. 2002.

11. Water resources are distributed rather unevenly: adequate in the northeast, they are scarce in the southwest and the center of the country, affecting both agriculture and human consumption. Agriculture has traditionally used about three fourths of all the water consumed in Kazakhstan. Despite some improvements in the 1980s, inefficient irrigation practices and lack of drainage have contributed to wastage of water as well as salinization of many irrigated lands⁷. Deterioration of irrigation structures has resulted in shortages, waste or both. The approach to

⁶ The table is intended to illustrate orders of magnitude rather than claiming accuracy. Official sources do not always distinguish between areas potentially and actually irrigated, and as a result, large discrepancies exist in the total, especially in the case of Kazakhstan (figures of up to 2.3 mil ha found) and Kyrgyzstan (up to 1.07 mil ha). Table 1 gives areas actually irrigated.

⁷ The diversion and withdrawals from rivers declined from an average of 18,000 m³/ha p.a. in 1980 to 12,000 cu m/ha p.a. in the early 1990s. By contrast, the salinity problem has continued to escalate throughout the same period.

water use has lacked a strong incentive dimension, the resource seriously under-priced to this day. On the positive side, promising beginnings have been made on creating new patterns of irrigation water use, based on water user associations, to succeed water management practices under the former co-operatives or state farms. River basin authorities (BVOs) remain an important element of water management structure that can be further strengthened. (See Map 2).



12. The largest industrial water users are power generation, metallurgy and oil production and exploration. These industries are also among the biggest water polluters. Some improvements in environmental performance are noticeable among newly established industrial facilities. Virtually no investments in domestic water or municipal wastewater treatment were made during the “transition 1990s” and are only now being re-instituted. Pollution of surface and ground waters⁸ has complicated the provision of piped water to settlements, already affected by the deterioration of the water supply infrastructure. In 1997, over 90 % of the Kazakh urban population, but only about a third of the rural population were connected to piped water supply. Conflicting official estimates exist of the latter figure.

2. Water Resources: The Aral Sea Basin

13. Large irrigation schemes serving water-demanding monocultures along the Amu Darya and Syr Darya rivers together with diversion of water for upstream hydropower generation from

⁸ Compared with 1990, the surface water has deteriorated in the Syr Darya, Nura, Ishim, Shu and Talas rivers. Some improvement is noticeable in the Irtysh and the Ural, traditionally the most heavily polluted.

1960s onwards resulted in a dramatic reduction of the inflows into the Aral Sea,⁹ never compensated for by the once-touted diversion of Siberian rivers southwards. The level of the Aral Sea, shared between Kazakhstan and Uzbekistan, has dropped by 15 meters and the area under water has shrunk to half of the Sea's size in 1950s. Loss of fisheries, increasing water salinity, pollution by pesticides and fertilizer run-off, salt deposition on the dry sea bed and its dispersion by wind have been among the principal consequences directly affecting some 5 million people in the basin. The contaminated water presents serious health hazards and the loss of agricultural productivity in the basin affects the local inhabitants' already precarious economic status.

14. The problem has attracted international attention and funding, most notably by UNDP, World Bank, GEF, EU and several bi-lateral donors. Aral Sea Basin Program was launched in 1994 aiming to gain adequate understanding of the problem and create a transboundary institutional structure needed to address its underlying causes. A strategic action program was adopted in 1997/1998 focusing on (i) quick-yielding and "visible" projects which would meet the interest of the states; (ii) developing common national and regional policies and action programs for water and environmental management with a target reduction of water off-take from the Aral sea tributaries of 15%; and (iii) outreach program to create a favorable climate for action. The effect of these measures nevertheless remains modest, the sheer scale of the problem and the difficulties in overcoming the transboundary aspects of the problem considered major explanatory factors. A reformulation of the Aral Sea Program is underway now against a renewed Government commitment and a better appreciation by the donors of the implementation challenges.

3. Water Resources: The Caspian Sea Coast

15. Unlike the Aral, the level of Caspian Sea has been rising, the second such period during the last century. Unlike the Aral, the causes are largely natural rather than man-made. However, the rise has coincided with an expansion of economic activities along the Kazakhstan's section of the Caspian shore, most notably oil exploration and drilling. The effect has been serious environmental degradation of foreshore areas caused by oil pollution, threats to the unique ecosystem of the Ural River delta and pressures on livelihoods.

4. Land Resources and Desertification

16. Major changes have taken place since 1991. Agricultural land has been redistributed away from collective and state farms in favor of smaller and differently managed units. The output has plummeted in response to transition difficulties resulting in a mix of positive and negative environmental repercussions. The approximate halving of the area ploughed, smaller size of the national herd, and reduction of fertilizer and pesticide use may have been positive in static environmental terms but the sharply reduced incomes have led to coping strategies (e.g. pattern of pasture use, depletion of resource commons) and outcomes (reduced willingness and ability to pay for environmental infrastructure etc.) that are far from benign environmentally.

⁹ The inflows that were about 60 cu km p.a. in the 1960s have declined to between 5-10 cu km p.a. now. The area of irrigated land has grown from several tens of thousand hectares in the 1950s to about 8 million ha now.

About 10% of all arable land located in the south and southeast is irrigated but virtually all of it at risk of salinization due to inappropriate irrigation and lack of drainage.

17. Existing estimates put the area of deserts and land subject to desertification as high as two thirds of the total land area of Kazakhstan. Desertification is particularly serious in the central and southern parts of the Aral Sea basin. Besides overgrazing, the problem has its roots in unsustainable agricultural and water management policies of the Soviet era (linked to the predominance of monocultures such as wheat in the north and cotton in the south) that have not been overcome to this day. Decline in soil fertility through wind erosion at first, followed by increased salt deposition and special problems associated with the substantial increase in fallow land after 1991 (e.g., increase in the incidence of locust infestation) have added to the overall pressure on land resources. The problem spills over the national borders and is a factor contributing to the dust and sand storms in North-East Asia. Conversion of the least productive portions of wheat producing land to grasslands and rangelands is being considered linked to the creation of carbon sinks for the purposes of Kyoto Protocol financing mechanisms. However, its feasibility remains in doubt as pasture degradation has not been brought under control yet and natural restoration is very slow in the climatic conditions of Kazakhstan.

18. The National Environmental Action Plan (see below) estimated the total annual damage due to desertification and land degradation in 1997 at between \$ 4.6 billion and \$ 6.2 billion p.a.¹⁰ The largest category was the loss of humus on arable land, followed by the cost of pasture degradation and secondary salinization. The 2002 draft National Action Plan to Combat Desertification (NAPCD), used similar estimates to illustrate the scale of the problem. The figures have not been subject to a technical peer review and are probably overestimates: the opportunity cost of land abandonment in conditions of sparse and declining population such as those of rural Kazakhstan are lower than commonly assumed. Spatial variations in the extent of the problem, too, counsel caution in readily accepting the aggregate estimates. Methodological questions notwithstanding, however, the problem and its concentration near many Soviet-era artificial population centers are clearly of major policy and livelihood concern.

5. Association of Poverty with Environmental Decline

“Worsening environmental conditions are directly associated with increases in poverty. Poverty incidence ranges between 45 and 87 percent in environmentally unfavorable areas. The major factors are water and air pollution and desertification.” [Sargal (2003)]

19. Of the roughly 4 million people under the official poverty line in 2001 (over 28% of the total population), almost 3 million live in rural areas, most affected by—or particularly susceptible to—land degradation. This is not to deny the complexity of the poverty-environmental-degradation nexus in rural Kazakhstan in which the simultaneous and slow restructuring of the agricultural sector also plays an important role. Poverty coincides with environmental stresses in Atyrau, Zhambyl, Kyzyl-Orda *oblasts* (see Map 3) but environmental stresses are also high in Mangistau and Atirau that are amongst the richest, on average, *oblasts* of Kazakhstan. In several *oblasts*, poverty has been accompanied by severe pressure on existing natural resource base (firewood, game, etc.). A widening gap in the quality of life between towns and villages and a social policy that has yet to accurately target poverty are major challenges for the Government of Kazakhstan. Effective targeting of environmental

¹⁰To put this in perspective, Kazakhstan's GDP in 2001 was an equivalent of \$ 21 billion (or \$110 billion at PPP).

problems is a dimension of the wider problem of protecting rural livelihoods and it, too, remains elusive. The difference between basin-wide problems such as those of the Aral Sea hinterland and specific activities at a farm or enterprise level is substantial and effective responses require integration and coordination of policies and procedures across a wide spectrum of actors and agencies, never an easy task.

Map 3: Administrative regions (oblasts) of Kazakhstan

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6. Unbalanced Structure of Energy Use and Energy Inefficiency

20. During the USSR days, Kazakhstan's industry was structured to tap the area's abundant natural resources (oil, ferrous and non-ferrous metals etc.). Bold, big, but energy-inefficient and polluting, the legacy of this pattern is felt to this day. Following the decline of industrial production, electricity output in mid-1990s fell to about 60 per cent of the 1990 levels. Most of the decline occurred in the thermal segment of the energy sector, more affected by the transitional problems than the hydro segment. Electricity consumption has recovered somewhat since then. Coal also accounted for 40-50 per cent of household energy consumption. Kazakhstan has 71 power plants, including five hydroelectric power stations, giving the country an overall installed generating capacity of 17.3 GW. Most of Kazakhstan's power plants are combined heat and power plants, approximately 70% of which use coal of relatively poor quality (unlike the Karaganda hard coal used for coking), 15% natural gas, and the remaining 15% hydroelectric power. Much of the country's electric-generating equipment is old, inefficient, and lacking in modern pollution controls. Some retrofitting has taken place during the last decade -

some with foreign assistance— but the slow recovery in the demand for electricity has put a brake on the technological upgrading of the sector.¹¹

21. Kazakhstan is a net and growing exporter of oil and oil products but, for the time being, a net importer of natural gas. The renewable energy potential has been largely undeveloped. Considerable potential is believed to exist for small hydro installation (units <10 MW capacity). Over 400 such potential sites, many of them of the run-of-the-river kind, are said to exist offering a total potential capacity of almost 1.4GW and about 6TWh of mean annual consumption. This is significant as 5,000 villages were not connected to the grid in 1997, mostly in the energy deficient southern part of the country. The development of renewable energy options is inhibited by the existence of surplus thermal capacity in some areas and absence so far of a unified policy and organizational structure for the renewables. Under current prices and cost structure, a number of mini-hydro projects is thought to be viable economically, the viability of renewable options further increasing with the distance from the existing electricity grid. Other options would become viable if a subsidy (e.g. through GEF joint implementation mechanism) were available. Increased demand for energy anticipated during the rest of the current decade could further improve the economic prospects for the renewable sub-sector.

7. Industrial and Urban Pollution

22. Attempts to control industrial emissions pre-date independence. They proved unsuccessful during the final days of the Soviet era despite complex (too complex, in fact) emission and ambient standards, and they continue to defy the country's regulators. Some successes have been registered (see footnote 1) but much more is needed. The build-up of industrial wastes, hardly managed during the Soviet era, has slowed down only temporarily during the initial years of the transition period but has continued since then. Pervasive pollution of surface water and groundwater associated with oil production affects soils and waters of the Caspian Sea and its foreshore. Five billion tons or so of mine tailings are estimated to occupy 14,000 ha of land in different parts of Kazakhstan, causing air and water pollution. Some two million tons of wastes from uranium mining pose serious health threats. Radioactive contamination of areas in the vicinity of the former nuclear testing facilities around Semipalatinsk presents special challenges¹². Kazakhstan's voluntary nuclear disarmament has removed the problem of future build-up without, however, dispensing with the task of remediation of past excesses. In general, responses to the problems posed by "old" waste are hindered by poorly developed environmental liability provisions.¹³

23. Most municipal wastes are landfilled, often in a rudimentary fashion and objections by some NGOs to incineration have inhibited policy responses. There are no modern facilities for waste collection and recycling. Municipal waste is often mixed with hazardous industrial wastes and there are no facilities for safe disposal of medical wastes. Solutions tend to be seen exclusively in terms of more hardware ("trucks").

¹¹ Although energy consumption per unit of real GDP has declined by more than a third since 1990 in Kazakhstan, International Energy Agency (IEA) 2002 data [reproduced in WRI (2003)] of energy use per unit of real GDP show Kazakhstan to be the second most profligate user of energy in Asia after Uzbekistan. Measured this way, energy efficiency in Kazakhstan is about a third of that of Japan but also much lower than in China.

¹² This area, like the Aral Sea vicinity, is officially designated as an environmental disaster area.

¹³ Some liability provisions exist in civil and criminal law but their usefulness in the environmental domain is yet to be tested.

24. Air pollution is a problem in Almaty and several large industrial cities in the north (the Karaganda-Timirtau-Ekibastuz industrial area) and the industrial towns of Zhezkazgan and Balkhash, in part because of inappropriate location and poor environmental performance of local industries and continued widespread use of coal for electricity and heat generation, but also on account of vehicular pollution.¹⁴ Leaded petrol continues to be the norm for the time being, the vehicle fleet is polluting, and the policies toward dealing with the problem until now incomplete and uncoordinated.

8. Management of Renewable Resources and Biodiversity Conservation

25. Man-made pressures on ecosystems and their most vulnerable and diverse segments (mountains, riverine and coastal zones) continue to take their toll. The extent of areas accorded protection (about 16,000 km² or 0.5% of the total area, the lowest of all countries of Central Asia) is very small by international standards and even this small protected realm is underfinanced. A number of relatively small activities, some funded by GEF, have been implemented to protect the key ecosystems and their components such as the Tian-Shan mountains (see Appendix C for more details).

26. In 1990, forests covered 3.7% of Kazakhstan territory. The government program “Forest of Kazakhstan” (Phase I during 1999-2003, and Phase II in 2004-2006) envisages an increase to 4.6% by 2010 and 5.1% by 2020.

9. Emerging and Unresolved Transboundary Environmental Issues

27. The break-up of the former Soviet Union marked the end of a complex unified energy-water management system involving the former SSRs of Central Asia. The main features of the system were (i) supply of water by upstream republics (mainly Tajikistan and Kyrgyzstan) to downstream areas (most of Kazakhstan, Uzbekistan, parts of Turkmenistan); (ii) generation of hydroelectricity by upstream republics for export to downstream locations (e.g., South Kazakhstan)¹⁵ in exchange for shipments of coal and hydrocarbons from downstream location to upstream republics to supply their winter energy needs; and (iii) releases of reservoir water upstream to coincide with the period of maximum need (i.e., summer). Following independence and collapse of former energy transfer arrangements, optimization on a Central Asia scale—ultimately unsuccessful—was replaced by nationally-driven approach to the use of water: upstream states release much less water in the summer in order to conserve it for their winter energy needs. As a result more water is now released during winter when little of it can be used and, instead, is wasted (e.g., flowing into the Arnasai depression of Uzbekistan), never reaching the Aral Sea. Lower summer releases exacerbate water shortages in downstream locations that, over time, have become used to an assured water supply and inefficiency in its use. A number of environmental problems of Kazakhstan described earlier on have their origin in this transboundary water-energy relationship.

¹⁴ Yet the number of vehicles per inhabitant has declined since 1990 by almost 50% although the overall figure hides the growing proportion of passenger cars relative to industrial vehicles and a changing pattern of vehicle use.

¹⁵ Hydropower currently accounts for about 28% of total power production in the Aral Sea Basin.

28. The remedial measures have attempted to tackle the transboundary aspect as well as the accompanying factors, domestic in character. Among the former, a number of inter-state water-sharing agreements have been entered into and regional initiatives supported to forge co-operative solutions to the problem. USAID, ADB, and World Bank continue to play an important role in supporting this process technically and financially. Despite these efforts, progress has been modest, major advances foundering on unresolved water-energy interdependence issues. On the domestic side, efforts have centered on improving irrigation efficiency and other water management practices. Other initiatives target physical improvements of the Syr-Darya channel that would make it possible to increase the winter river flow into the Aral Sea.

29. There are other transboundary river basins where collaboration has been even slower in coming. Both the Irtysh and the Ili originate in China and significant cross-border collaboration concerning the quantity and quality of transboundary flows is yet to be initiated.

C. Government Policies

1. Policy Formulation

30. During the short period since independence, Kazakhstan has succeeded in creating a stable and peaceful country and putting in place much of the institutional infrastructure needed for the functioning of a market economy. Strategic planning has been introduced, setting out the broad direction of the country's development including its approach to environmental matters. The key documents, *The Long-term Development Strategy 2030* and *The Strategic Plan of Development of ROK till 2010*, show awareness of the scale of the environmental challenges summarized earlier on. *Strategy to 2030* and *Plan to 2010* have been translated by the then Ministry of Natural Resources and Environment (MNREP) into its phased program. Four phases (1998-2000, and three subsequent decades) were distinguished. The over-riding objectives during Phase I was the creation of (i) an effective system for governmental protection of environment, (ii) foundations for a rational use of natural resources, and (iii) a system of environmental education. Phase II (2001-2010) targets, among other things, further legislative improvement and waste recycling. The adoption of *Plan to 2010* led to a more specific work program of MNREP for the period 2002-2004. Among other things, the program favors the introduction of a unified environment and nature monitoring system, use of economic mechanisms to manage surface and groundwater, integrated management of resources within river basins, promotion of ISO 14001 and introduction of mandatory environmental insurance for activities involving hazardous substances.

31. Kazakhstan attended the UNCED in Rio in 1992 and has played an active role in post-Rio initiatives and developments since then (see below). The concept of sustainable development has been formally embraced by the Government. Kazakhstan Agenda 21, understood not as a time-bound or single-document activity but more as a process of translating the generalized commitment to sustainable development into reality, has been given government and donor backing. The commitment to the concept was re-confirmed in 2002, when the Government endorsed the seven United Nations' *Millennium Development Goals*, one of which is to ensure environmental sustainability and associated targets of (1) integrating the principles of sustainable development into country's policies and programs and reverse the loss of environmental resources and (2) halve, by 2015, the proportion of people without sustainable access to safe drinking water. The Government attended the 2002 WSSD and through its President, has since announced the intention to encourage the integration through the creation

of a broadly-based National Commission for Sustainable Development. The Government recognizes that the bulk of environmental policy setting until now has been formulated at the central level, with only a modest participation of the government's lower tiers and local populations. Efforts are underway to begin formulating "local Agendas 21" as platforms for sustainable development of selected areas and communities.

32. A *National Environmental Action Plan (NEAP)* was formulated in 1998 to articulate environmental priorities and identify key interventions designed to achieve the sustainability objectives. NEAP-generated prioritization, by now widely shared in Kazakhstan and among the donor community, places water shortages and pollution, desertification, degradation related to oil and mining activities, industrial and municipal solid waste management, and insufficiency of forests and protected areas at the top of the list of concerns requiring urgent action. More than seventy priority projects were identified with an initial total investment tag of over half a billion US dollars. The process of translating NEAP priorities into specific investment projects and their funding by international donors and lenders has been slower than expected (see below) but the logic of the process continues to be accepted.

33. Several strategies and plans for sectors with significant linkages to environmental management have been prepared, including the *Strategic Water Resources Plan*, "*Fresh Water Program 2002-2010*", *National Drinking Water Action Plan*, *Energy Strategy*, *Energy Development Action Plan*, *National Program on Energy Saving*, *National Environment Hygiene Action Plan* and *Program of Environmental Education*. Each of these documents contains its own environmental perspective. Take the 1999 Energy Strategy as an example: It places emphasis on (i) reducing the impact of coal and energy production on the environment, (ii) increasing energy efficiency (target of 15-20% over the next 10 years), and (iii) strengthening energy independence. Among more specific targets of the strategy are improvements of coal quality, better management of coal ash, development of renewable energy (wind, solar, coal-bed methane)—but also more strip mining of coal. The Strategy relies principally on the development of a power and energy market for increasing energy efficiency rather than on a command approach.

34. National Action Plan to Combat Desertification (NAPCD) is more explicitly environmental in nature. Its initial (1997) version incorporated a number of strategic directions, but was weak in programmatic content and linkages with the national development strategy and Kazakhstan's long-term policy goals. A new NAPCD was drafted in 2002. More operationally oriented and better informed by Agenda-21 methodology, it places emphasis on better coordination and cross-sectoral integration as well containing proposals for institutional restructuring — establishment of an Interdepartmental Commission to Combat Desertification (IDCCD), a combined coordinating mechanism for the three Rio Conventions, a Center to Combat Desertification to function as an office of interdepartmental and interdisciplinary technical management and coordination, and *Oblast* Committees to Combat Desertification, which would also involve NGOs and CBOs.

35. Elsewhere (e.g., clean production, vehicular pollution, other non-point source mobile source pollution and others), sectoral let alone cross-sector analysis and formulation of strategies, policies and action plans have neither not yet been attempted or are in their early stages. In the case of clean production, for instance, Kazakhstan signed the UNEP International Declaration on Cleaner Production and established three Cleaner Production Centers, of which one in Pavlodar is still operational, though not really stimulating or implementing cleaner production activities.

2. Institutional Developments

36. New environment legislation and regulatory provisions are being created, gradually superseding the Soviet-era provisions. The principal new instruments adopted during the transition decade were the Water Code (1993), Law on Ecological Expertise (1997), Law on Environmental Protection (1997), Law on Specially Protected Natural Territories (1997) and Law on Energy Saving (1998). A new Tax Code was passed in 2001 containing provisions for payments for the use of natural resources. In 2002, a new Air Pollution Law finally replaced the Soviet-era legislation. The number of instances where old regulatory instruments continue to be in force is much reduced. In other cases (e.g., the Water Code), new legislation quickly became dated and revisions became necessary (the passage of the new Water Code is said to be imminent and the key Law on Environmental Protection itself is under revision). All in all, there are at present some 200 legislative and regulatory provisions with direct bearing on environmental management in Kazakhstan and further legal and regulatory instruments are being drafted. The structure is complex as the new legislation still coexists in some cases with old regulatory provisions. There are inconsistencies and overlaps as well as serious gaps in coverage in spite of the already large number of legislative documents. Rapid and unanticipated changes in the structure of the country's economy contribute to premature dating of some of the instruments. Recent legislative amendments have not necessarily increased the internal consistency of the legislative structure.

37. The institutional approach to environmental management has the Ministry of Environmental Protection (until August 2002, Ministry of Natural Resources and Environmental Protection) and its staff of 106 at its apex (See Appendix A). With the 2002 reorganization and the transfer of the Ministry from Kokshetau to Astana, the Ministry of Environment Protection lost several areas of traditional responsibility, most notably water (now again part of the Ministry of Agriculture), following an earlier transfer of its responsibility for forests and mineral resources (to MOA and Ministry of Energy and Mineral Resources, respectively). The full significance of these changes is yet to be assessed but it does suggest that there are concerns about a potential conflict of interest inherent in combining production and conservation responsibilities in a single body and in the minds of many, MEP's role should be that of industrial pollution control agency only.

38. The local structure of environmental management consists of *oblast*-level and selected *rayon* Environment Agencies, currently comprising about 1500 staff (i.e. an average of 80 per *oblast* or *oblast*-level city) subordinated technically to MEP but administratively and budget-wise to *the akimats*. Staffing levels vary from *oblast* to *oblast* reflecting mainly the importance of industry –the usual focus of local monitoring activities—in each *oblast*. Monitoring of industrial emissions and collection of pollution charges are the focus of local environmental management.

39. MEP relies on several institutes (KAZHYDROMET, KAZNIIMOSK) for the monitoring of ambient quality. These institutions' local network (the adequacy of which is a matter of some dispute) provides local coverage.

40. New administrative units were created during the last decade to respond to (i) Kazakhstan's international environmental commitments; and (ii) demands of regional environmental collaboration. The former include, for instance, the Inter-Agency Commission on the Ratification of the Kyoto Protocol. The latter include Interstate Commissions (e.g., ICWRM, ICSM) with Kazakhstan's representation and the executive councils through which the Commissions work.

41. Though not formally part of the environmental management structure, a number of other bodies have mandates that contain some environment-related responsibilities or powers. At this stage of institutional development in Kazakhstan, the delineation of mandates is complex containing elements of duplication and ambiguity. As a result, environmental management in Kazakhstan is time-consuming its effectiveness blunted by the need to reconcile the many and diverse requirements of different organizations. The greater demands for information increasingly placed on MEP by environmental NGOs further add to the administrative challenge faced by that Ministry.

3. Regulation and Financing of Environmental Management

42. Environmental regulation of economic activities in Kazakhstan is based on a permitting system supported by technologically determined maximum permitted concentrations (MPC) coefficients. It is supplemented by a system of permits and licenses for access to, and use of, natural resources. The system is administered by the local Environment Agencies for industrial discharges, the Committee of Forestry, Fishing and Hunting of MOA for the three activities concerned, the Water Resources Committee of the MOA for access and use of water, and Committee of Geology of the Ministry of Energy and Mineral Resources for mining. As of 2000, about 4,500 industrial permits had been issued. In addition, a system of environmental assessment (“environmental expertise”) is in place¹⁶ as well as elements of environmental or ecological zoning, including large-scale zoning prepared under of the National Environmental Action Plan.

43. Pollution charges are an important element of the regulatory framework. The charges have a two-tier structure (basic and over-the-limit rates). The rates themselves (as well as charges for non-toxic and hazardous waste) are based on the toxicity of the different elements of the pollution stream and are set by *oblast* authorities at levels considered sufficient to cover the cost of environmental administration in the *oblast* concerned. As a result, variations on the order of 1:10 exist in the rates applied by different authorities. The structure of fees and royalties for natural resource use superficially resembles that found in many countries in imperfectly capturing (or trying to capture) the underlying value of the resources in question. Certain exemptions exist (e.g., of the nationals from hunting fees). The existing payment structure is acknowledged by the Government to lack a solid economic basis. Other, more conventional, taxes and payments influencing environmental outcomes such as differentiated taxes (e.g., on leaded and unleaded gasoline, other types of fuel, different classes of land) complete the fee structure. Extending and reforming the use of economic instruments for environmental management is among the stated institutional priorities of MEP.

44. Until 2000, the proceeds of resource fees and licenses accrued to one of 16 (14 *oblasts*, Almaty and Astana) *oblast* environment protection funds, in principle to be spent for environment-related purposes. The division of total proceeds of environmental payments between the central and *oblast* governments varied during the late 1990s. In 2001, the allocation to the funds became indirect, via *oblast* budgets. Finally, in 2002, the earmarking or pollution charges to environmental purposes ceased altogether and where the term

¹⁶As in other CAR republics, “imported” concept of EIA was superimposed on the Soviet-era concept of environmental expertise. The result has been unclear regulatory provisions and inconsistent interpretation of how the terms are to be understood and the regulations put into practice.

“environmental fund” has survived, it merely refers to the process of monitoring the process of pollution revenue transfer to the *oblast* budget.¹⁷

45. The subject of earmarking is clearly of major importance. In Kazakhstan’s case in the late 1990s, earmarking was accompanied by lack of transparency in the uses of the revenue and its removal had a support of IMF and the World Bank. There were other arguments, in particular the advantages that unified budgets have of not pre-judging the efficiency of any particular class of investments (such as environmental investment) and not pre-emptying potentially more profitable investment options. On the negative side, efficient allocation of public investments requires an “even hand” and even ability to defend particular investment options. Where this is not so, earmarking could be a temporary (if blunt) second-best arrangement. The insufficient capacity of MOE to fight for “its” investments is argued throughout this report to be a major weakness of environmental practice in Kazakhstan. If earmarking is to remain unavailable as a policy option, this weakness needs to be overcome.

46. There are at least three other sources of environmental finance in Kazakhstan, namely (1) direct budget allocations, (2) foreign grants and loans; and (3) enterprises’ own investment for pollution control. In 1999, the category (3) accounted for almost 90% of the total official expenditure on environmental management of T18.9 bill (\$120 million equivalent then or about 0.7% of the GDP). The balance, i.e. the funds available to the MEP to directly influence the environmental outcomes, thus amounted to no more than \$12 million equivalent (of this, the share of *oblast* environmental protection funds –still in existence in 1999– was about a third).¹⁸ Almost three quarters of all environmental expenditure was allocated to the management of air pollution, 5% each to water and land resource protection and the balance to other uses. The pattern of expenditure reflects the predominance of investments by enterprises (rather than the State) in the official total of environmental investment, and is seriously out of line with stated environmental priorities dominated not by air pollution but other concerns, especially water management.

47. Throughout the period of pollution charge earmarking, over three quarters of environmental fees were diverted to the general revenue. That situation continues to this day. In 1999, the State collected T2,700 million in pollution charges, T8,350 million in minerals-related royalties and T8,600 million in fuel excise duties, i.e., about \$164 million equivalent then, in taxes with an environmental impact. The figures have been interpreted by most observers [most notably by UN ECE (1991)] as the State effectively using environmental charges to finance non-environmental priorities. By investing little in environmental management the State is also presumed to have accepted the overall –and inefficient– investment bias against environmental priorities other than air pollution. Though probably correct, caution is required before this verdict can be accepted in full. Official figures of environmental expenditure cited above present only a part of the overall picture. They do not include investments made by ministries other than MEP on activities that span the production-environment divide (e.g. by MOA on irrigation

¹⁷ The future of environmental financing is closely linked to the ongoing reform of public finance in Kazakhstan in which the assignment of revenues and expenditure responsibilities to different levels of the government play a major role. In its final form, central government would retain the responsibility for strategic, transboundary and global environmental duties while local governments would become responsible for all routine environmental management expenditures and would continue to retain all of the pollution charge revenues.

¹⁸ Current and development expenditure of MEP are about equally divided. The direct allocations by the State to MEP have risen from T110 million (\$1.2 million equivalent) in 1999 to T1,081 million (\$7.5 million equivalent) in 2001 and T 1,297 million (\$8.4 million) in 2003.

rehabilitation).¹⁹ The existence of this expenditure lessens the bias mentioned above. A careful study of environmental expenditure, properly defined, and its structure is yet to be undertaken and policy conclusions drawn. An important element in this analysis must be the role of the National Fund, set up in 2000 to collect and invest for future generations a percentage of “excess taxes” and other levies imposed on hydrocarbon and non-ferrous metals producers.

48. As to increased budget allocations to MEP noticeable in the last two years (see footnote 8), by themselves these are insufficient to demonstrate increased Government commitment to environmental management. In circumstances where environmental revenue is probably a net source of government income, the figures could equally well be interpreted as showing a greater determination to continue to rely on this funding mechanism. Defensible on the royalties side (if the proceeds are re-invested sustainably), the existing budgetary practices are harder to defend on the pollution-charge front.²⁰

D. Public Participation

49. Much more than before, Kazakhstan civil society plays a role in shaping the approaches to the country’s environmental management. Of the about 3500 NGOs in Kazakhstan in 2001, about 300 had environment-related matters as their primary focus. A number of these NGO are branches or associates of international environmental NGOs. As in most countries, the bulk of the NGOs are city-based, projecting mainly urban perceptions. There is a lively environmental press in Kazakhstan, government-run for the most part, and a good deal of information generated by the NGOs. Information revolution has reached Kazakhstan and with it, access to (also) environment-related information. A significant number of local environmental websites exist complementing and reinforcing the impact of international and regional information portals such as UNDP-sponsored <www.caresd.net> (Regional Information Portal on Environment for Sustainable Development for Central Asia and Russian Federation). Improved access of citizens to environment-related information has the Government’s general support but a legislative framework to promote public participation is yet to be created. The WSSD Report calls for improvement of the mechanisms of cooperation between state bodies and stakeholders.

50. Kazakhstan attended the European Ministerial Conference in Aarhus in 1998 and is a signatory of the related Convention on Access to Information, Public Participation in Decision Making and Justice in Environmental Matters. Involvement of the civil society in the field realities of Kazakhstan and its environmental management is on the increase. A number of local and foreign NGOs work, for instance, in the Aral Sea basin in close association with UNDP “Capacity 21” program and elsewhere in the country under similar programs.

E. International Commitments

¹⁹ Here the statistical convention clearly reflects the poor integration of environmental concerns into the official thinking and monitoring.

²⁰ Nevertheless rather than the difference between the pollution charge revenues and government expenditures on environment, more important for policy is the relationship between pollution charges and the abatement activities of the regulated community (i.e. the damage caused by continued pollution). The strong presumption in Kazakhstan is that the damage continues to be much greater than the revenue collected, let alone the amounts spent to counteract it. Whether the difference ought be shouldered by the Government (taxpayers at large) or by the polluters is the subject of the familiar polluter-pays-principle debate.

51. Kazakhstan has actively participated in most international environmental initiatives and conventions, including, most notably, the Convention on Biological Diversity (CBD), the Framework Convention on Climate Change (FCCC), the Convention to Combat Desertification (CCD) and –the only one so far among CARs– the Convention on Protection of Transboundary Waters and Lakes. By now, more than sixty environment-related conventions and corresponding protocols have been ratified by GOK. National strategies and action plans, mandated under these conventions, have been drafted. Kazakhstan is an active participant in regional environmental bodies such as the International Fund for the Aral Sea (IFAS), the Interstate Commission on Coordination of Water Resource Management (ICCWRM), Interstate Commission on Sustainable Development (ICSD) and the Framework Convention on the Caspian Sea Protection. Kazakhstan has given its support to ADB-cofinanced preparation of the Regional Environmental Action Plan (REAP). Kazakhstan is a Non-Annex I country under the United Nations Framework Convention on Climate Change (ratified May 17th, 1995). It is a signatory to (March 12th, 1999) –but has not ratified yet– the Kyoto Protocol. An Inter-Agency Committee on Climate Change was established in 1998. Kazakh Scientific and Research Institute of Environmental Monitoring and Climate (KAZNIIMOSK) has been in existence since 1993. Inventory of GHGs was conducted in 1990 and again in 1994 (CO₂ and methane predominate) and an assessment of the country's vulnerability to climate change conducted during the period 1997–1998.

52. Through its participation in international conventions, Kazakhstan has quickly acquired familiarity with the conventions' rules and requirements, as well as gaining access to some funding, especially through GEF (see below). The local ability to formulate projects suitable for funding under these conventions, however, continues to be limited in spite of long-standing institutional support by, for instance, UNDP.

53. Kazakhstan's application for WTO membership is pending. In this connection, the relatively slow adoption of voluntary certification, especially ISO 9000 and the environmental ISO14000 series, is beginning to be seen by the Government as a potential competitive weakness of the country exporters.

F. Donor Programs and Activities

54. Kazakhstan's new openness and interest in seeking foreign financial and technical assistance for its environmental management objectives has attracted a large number of multilateral and bi-lateral institutions, and international NGOs. Virtually all UN-affiliated bodies have a presence or contacts with Kazakhstan. Like other NIS, Kazakhstan has been a client of *two* regional MFIs, i.e. ADB and EBRD. Academic and informal collaboration with outside world has also grown in importance and a considerable body of information, analysis and writing on Kazakhstan's environmental problems now exists.

55. Some of the institutional links established lie outside ADB's usual institutional reference framework. Thus apart from the usual multilateral and bilateral institutions assisting environmental progress around the world, other, less familiar to ADB, institutions support environmental management or some of its dimensions: the UN Economic Commission for Europe, (UNECE), Organization for Security and Co-Operation in Europe (OSCE), NATO, the North American Commission on Environmental Cooperation, and others. One of the challenges for ADB is to keep abreast of the volume of new material not all of which may be "ADB-Asia"-centered.

56. The World Bank Group, EBRD and ADB are the three largest multilateral lenders to Kazakhstan, their respective cumulated lending portfolios up to 2001 amounting to \$1.8 billion, \$0.6 billion and \$0.4 billion, respectively. To put things in perspective, the total inflow of private foreign investment into Kazakhstan was about \$14 billion, predominantly for oil production and related activities, during the same period. Of the three MFIs, The World Bank has been the largest source of lending for activities related to environmental management. Environment-related technical assistance has been led by USAID, EU-TACIS, UNDP/GEF with important contributions by Japanese and several European bi-lateral programs as well as the MFIs. Institutional strengthening dominates the technical assistance.

57. The World Bank's environmental program in Kazakhstan includes the Syr Darya Control and Northern Aral Sea Phase-I Project and an associated Pilot Water Supply Project. The former aims to help sustain and increase land-based activities in the Syr Darya basin and improve environmental conditions in the Syr Darya delta. The latter finances a pilot water supply project in urban settlements near the Aral Sea disaster zone. Under (1) Atyrau Pilot Water Supply and Sanitation Project, (2) North-Eastern Kazakhstan Water Supply and Sanitation Project, and (3) Nura River Mercury Clean-up Project, improved provision of drinking water and wastewater management for the cities in the basin (including Astana, the country's new capital) are targeted. Elements of environmental remediation feature in the Uzen Oil Field Rehabilitation Project. The target of the Irrigation and Drainage Improvement Project is self-explanatory. Smaller initiatives include support for biodiversity conservation, drylands management, NEAP preparation and various additional activities under the Aral Sea Program. Activities under consideration include community based natural resources management activities and further expansion of environmental lending to targeting the basin of the North-East (Irtys, Nura and Ishim rivers).

58. Together with social development and governance, environment is one of three strategic priorities of the United Nations Development Program (UNDP) in Kazakhstan. Its portfolio of environment-related activities includes several livelihood and environmental management projects in the Aral Sea Region, the Caspian coastal areas and around Semipalatinsk. UNDP supported NEAP preparation and the setting up of the National Environmental Center. Several projects have been developed jointly with the Global Environmental Facility (GEF). They include the "In-Situ Conservation of Kazakhstan's Mountain Agro-biodiversity" project, development of a program to phase out ozone-depleting substances, promoting technology transfer related to wind power production, and assistance to the Government in meeting the requirements of key international environmental conventions.

59. UNICEF and UNESCO have been involved in several activities related to the Aral Sea crisis, UNEP has been coordinating the Caspian Environmental Program under World Bank/EU TACIS/GEF financing. UNESCAP has played a role in regional environmental consultations and cooperation.

60. Under its Environmental Policies and Institutions for Central Asia (EPIC) program, USAID has focused on water management and energy-related issues including their global-climate-change repercussions. A Climate Change Center now operational in Astana is one of the outcomes of the Greenhouse Gas Emissions Reduction Initiative (GGERI). Under the Improved Management of Critical Natural Resources Program, a variety of activities are sponsored from the management of oil pollution to responses to salinization of soils.

61. Among UE TACIS-funded projects is a control of vehicular pollution in Almaty, setting up of a Regional Environment Center for Central Asia (REC-CA) and several activities in the

environmentally critical Aral Sea and Caspian coastal areas (WARMAP and WARMIS Projects). GTZ has funded improved water management in Almaty City and promoted clean production, JICA has been active in the area of solid waste management and disaster preparedness, the Swiss Government has financed conservation in Tian Shan mountains. FINNIDA, UK's DFID, and French and Canadian bi-lateral or regional assistance are also present. Appendix C provides a complete picture of donor assistance.

III. THE WAY FORWARD: PROMOTING SUSTAINABLE DEVELOPMENT

A. Improving Policy Formulation

62. The co-existence of numerous activities of the Government and foreign donors described earlier and the absence of uniform improvement of environmental conditions²¹ poses the problem of identifying and appropriately responding to the causes of slow progress. For simplicity, we shall consider these factors under the headings of (i) policy formulation and (ii) management capacity and implementation.

63. The weaknesses of environment-related policies and practice in Kazakhstan have been mentioned by several observers as well as those in the Government most exposed to the "Agenda 21 thinking". In the Government's report to the World Summit on Sustainable Development ("*WSSD Report*") in September 2002, the Government—largely echoing the donor community's view—has identified the following as the key barriers to environmentally sustainable development: (i) lack of integration of environmental protection measures into economic and social sectors, (ii) absence of research directed at identifying points of integration among economic, social and environment sectors, (iii) inappropriate policies and insufficient use of market-based instruments to provide incentives for pollution prevention and sustainable utilization of natural resources, (iv) lack of public involvement in the process of strategic planning, including local development planning, (v) unclear division of state responsibilities and power among levels of administration for environmental management, (vi) inadequate human resources, especially at local levels, (vii) inadequate environmental awareness, and (viii) lack of financial support. Among the Report's recommendations is the establishment of the National Commission for Sustainable Development, by now favored by the country's presidency, a more aggressive development of inter-sectoral and inter-departmental mechanisms of cooperation and coordination in decision-making, development of sustainable development indicators and support for integrative research.

64. Several things are important to add. First, there are relatively few disagreements about what the broad environmental priorities in Kazakhstan are, but insufficient basis exists for calibrating the responses. The National Environmental Action Plan continues to serve as a point of reference heeded by both the Government and the donors/lenders (World Bank, most notably). The weaknesses of NEAP lie elsewhere: The Plan lacks a firm economic basis that would make it possible to compare the social profitability of expenditures on any of the several dozens of priority project candidates identified. The absence in NEAP of adequate discussion of its financing is another of its weak spots. The implicit reliance in NEAP on foreign grant funding temporarily removed the urgency of reviewing the entire approach to environmental financing in Kazakhstan. That issue clearly emerges as one of new policy priorities as most of the activities

²¹ *Environmental Statistics 2001* prepared under ADB RETA 5860, give a mixed picture. There has been some improvement in several parameters of air quality in the main industrial cities during the last decade but also evidence of continued deterioration of rural environmental conditions. See also Appendix E.

recommended by NEAP remain unimplemented. The improving budget position of the government would make the timing of such a review opportune.

65. Second, clearer now than it was at the time of its preparation is the NEAP's tendency to formulate priorities as a series of specific problems and responses to them rather than through a more systematic development of policies, and mechanisms that integrate environmental consideration into sector development policies and plans. This gap is only now being bridged through development of sector strategies and plans of varying quality. Here, "uni-sectoral" approaches towards water, forests, energy, etc. continue to outshine cross-sectoral approaches. New, integrative, policies and their pilot testing are needed in areas such as rural development that would incorporate politically sensitive but vital issues such as environment-related population re-settlement as well as the more traditional concerns of land and water degradation, salinization, deforestation, overgrazing and declining soil fertility²². Much more attention needs to be given to developing the capacity to estimate the economic and financial gains that better cross-sector coordination offers in order to overcome the skepticism of budget authorities.

66. Third, the complex but fundamental issue of liability for past environmental damage has not been addressed systematically until now. The absence of policy here inhibits private investment and makes it difficult to determine the desirable scale and pace of remediation efforts.

67. Fourth, environmental policy formulation in Kazakhstan proceeds on two parallel tracks: national and regional. The main elements of the latter are (1) specific programs tackling transboundary environmental problems such as the Aral Sea Crisis or the problems of the Caspian Sea, in both cases accompanied by the creation of *ad hoc* institutional structures and programs (IFAS and a several related action programs, and the Caspian Environmental Program); (2) development of region-wide environmental structures and initiatives, most notably the Regional Environmental Action Plan (REAP) and, on the institutional side, the Inter-State Commission of Sustainable Development and Inter-State Commission for Water Coordination. Policy formulation in all these cases has been donor-driven. Partly for that reason, the priorities identified under regional initiatives do not always match national environmental policies and programs. In Kazakhstan's case, a big gap exists, for instance, between the regional emphasis on solid and hazardous waste management contrasting with a virtual absence of a unified national policy on that subject and the donor void in this domain. In the case of the Caspian Environmental Program, it is only weakly linked to the major economic activities in the area.

68. The increase in the sector work together with perceived urgency to achieve greater cross-sectoral integration has partly shifted attention away from the weak economic foundations of environmental policy in Kazakhstan. Although most policies may be "in place" they are not necessarily the best policies. For instance, resource pricing, especially that of water, agricultural inputs and environmental services, is far from settled being driven more by political acceptability than efficiency or environmental considerations. The relative merits of different forms of supporting rural livelihoods (e.g., through water subsidization or through other means) have never been fully explored. Targeting of priorities, budget allocations and legislative developments each has a weak economic and analytical basis. There is a void regarding some of the economic parameters of environmental policy. After some initial interest, the work on

²² Kazakhstan's river basin organizations are something of an exception within this overall picture in that they are organized on a spatial basis around a common management task rather than in the traditional vertical manner.

economic valuation of environmental impacts has ceased and environmental policy-making is hobbled by this absence.

69. The process of translating the overall socio-economic vision for the country (*Strategy 2030* or *2010* documents) into more specific environmental strategies and, ultimately, programs or projects is perhaps the Achilles heel of policy formulation in Kazakhstan. First, the overarching documents themselves are statement of objectives rather than road maps. So far, they have been translated by MEP not into an environmental strategy but into a disaggregated set of environmental objectives. NEAP, for its part, is not a strategy but a set of priority concerns. The task of translating the objectives of priority concerns into implementable projects or programs has been largely left to those prepared to finance them (including ADB and World Bank). The capacity of government agencies to identify and prepare projects and programs for funding continues to be weak, especially at the local level. Even more scarce is the local capacity to develop programs and projects that capture a variety of environmental or cross-sectoral synergies (e.g., combining desertification control efforts with conservation of biodiversity or tree planting).

70. As in most other NISs, an institutional divide exists in Kazakhstan between the top environmental body and bodies that are not environmental in name but manage sectors with far-reaching environmental impacts (water to start with but also energy, agriculture and land). As argued earlier, the removal of potential conflict of interest this separation entails is a positive feature. At the same time, the ability of MEP to mainstream environment has been weakened. There are, to be sure, procedures and mechanisms that facilitate policy coordination in these circumstances (interdepartmental reviews, working groups, and more recently inter-agency commissions) but most of the cross-sectoral inputs come at a late stage of policy formulation and implementation. In other cases, the inter-agency consultation exists on paper mainly.

71. Steps have been taken by the donor community, especially the UNDP, to address these weaknesses but after half a decade of efforts, there is surprisingly little to show. Mechanisms set up to strengthen the Ministry of Environment and its policy formulation and coordination capacity largely ended up as a substitute for the Government's own effort. The National Environment Center, in theory emerging out of the NEAP process, has never been truly a national center formulating and articulating national environmental priorities but rather a unit helping the Government to digest a fast growing sustainable development agenda and to meet the essential obligations under international environmental conventions. The national focal points (all MEP-based except the Climate Change focal point),²³ too, largely continue to depend on donor technical assistance. Much of the problem resides in the insufficient staffing and budget strength of MEP and an absence so far of any other domestic institution that could fulfill at least some of the integrative role. The Government's commitment to improving the country's environment has disproportionately rested on donor assistance, an untenable situation, especially in the changing economic circumstances of today.²⁴

72. In short, mainstreaming environmental concerns has proven easier to lament than tackle through specific proposals. There is little doubt about the complexity of the cross-sectoral approach. Even a document as relatively wide-ranging as the 2002 Draft National Action Plan

²³ This is in contrast to the PRC, for instance. Successful mobilization of GEF resources in that country is attributed by many to the placing of GEF coordination within the Ministry of Finance.

²⁴ In this situation, a performance-based allocation of technical assistance funds suggests itself as one of the ways to break the "incentive-less" pattern of past support.

on Desertification Control can be (and has been) criticized for not being integrated into macro-economic and poverty-reduction strategies. Mainstreaming on the policy side requires, furthermore, modifications of the legislative framework that would offer a unified legal approach towards tackling the given problem. Fundamentally, however, mainstreaming requires a culture of problem-solving and search-for-value rather than passive carrying out of existing policies. For now, both of these are in a relatively short supply within the government apparatus.

B. Strengthening Environmental Management Capacity

73. Despite the many problems and weaknesses of environmental management in Kazakhstan, the situation is not altogether bleak. The country has created a structure of environmental regulation and management that is logical, easily recognizable and functions – imperfectly, but function it does. In technical matters, substantial technical and scientific resources exist. At the same time there is little doubt that environmental management is underfunded. The fiscal caution across all levels of government, as well as the habit-forming dependence on foreign grant funding for the majority of policy- and institution-related environmental assistance are among contributing factors.

74. In Kazakhstan, as in many other countries, the importance of MEP continues to depend on the political “clout” of the Ministry’s upper echelons that have changed frequently in recent years. The caliber of staff working for the Ministry is at least in part a reflection of the existing employment picture in urban location. Here, Kazakhstan seems to have fallen victim of its recent success in reviving the economy. The private sector opportunities are opening up and competing for the middle management levels.²⁵ Donors need to acknowledge this reality. They contribute to the problem in any case by taking away some of the best and brightest. Donors should step up the training of middle level environmental staff and look for alternative ways of minimizing the effect of the brain drain, e.g., through environmental education support.

75. There is little doubt that the gap between the extent of sustainable development commitments made by, or expected of, Kazakhstan and the capacity to implement them is getting bigger, not smaller. This gap has now reached a level where it begins to threaten the very credibility of the measures being advocated. As suggested above, this may be the right time to consider best ways of bridging the gap. Different possibilities offer themselves from (1) better screening and greater selectivity of Agenda 21 activities. “Less could be more”; (2) more efficient deployment of MEP staff linked to a simplification of environmental regulations, especially the administration of pollution charges; and (3) reform of the financing of environmental management resulting in greater funding.

76. As far as environment-related legislation is concerned, the most acute current weakness is probably the lack of clarity about natural resources and their management, namely (i) the competence of the government bodies in management, use, and conservation of natural resources; (ii) the rights and terms of access and use; and (iii) the enforcement framework. In all three areas, environmental lawmaking needs to have substantive inputs by economists, unlike the pattern of legislative development so far.

77. The 2002 institutional streamlining of MEP has left open the question of environmental competence of bodies transferred out of the former MNREP (i.e. WRC, forests and mineral

²⁵ The Government’s own approach to minimizing losses of trained staff has relied on incentives such as subsidized housing loans. These are common in “priority” ministries such as those of Finance, Economy and Budget Planning or Energy and Mineral Resources. They have not extended to MOE.

resources). If these are weak —as suspected to be the case in MEMR— this is a cause for concern. Elsewhere, the policy formulation activities of MEP and those of MOA —the new home of the transferred agencies— continue to overlap. One of the objectives of supporting integration of policy is make this overlap “lean”, an opportunity to realize synergies rather than add to workload and generate duplication. Any new institutional support should be expected to spell out the linkages and synergies expected of it and its budget implications.

78. Local capacity to formulate policies, program and projects and implement them is weak. The problem is compounded by inherent difficulties of environmental management in a country of considerable surface but low population density such as Kazakhstan. The unit administrative cost of project formulation and implementation is high even when some environmental problems (e.g., mine tailings, urban waste management, etc.) are concentrated. There are important spatial differences in the intensity of environmental pressures and uneven financial and institutional strengths of local governments. *Oblast* and *rayon* MEP staff have been dealing primarily with industrial pollution problems, and are not well prepared and positioned to tackle the multi-dimensional, cross-sectoral environmental issues. Prevention tends to take a second seat to crisis management. Participatory approaches to diagnose the root causes of some of the existing environmental problems in Kazakhstan are particularly weak at the local level. Future institutional strengthening should be directed at this level of government, starting with *akims'* secretariats, and should address issues such as preparation of “LEAPs”, local Agendas 21, improvement of local financing of environmental initiatives, implementation of pilot projects, local monitoring, etc.

79. The proliferation of regional and subregional environmental programs or statements further increases the environmental management workload. Whether related to UN ECE Convention on Transboundary Water Issues, the Nukus Declaration on Sustainable Development of the Aral Sea Region, the WSSD-driven proposal to establish a Central Asia Sustainable Development Commission, or others, the regional and sub-regional commitments all demand administrative resources and attention. Throughout Central Asia, the balance between a desirable diversification of development partners and the additional administrative cost of working with multiple partners and initiatives may be turning against the former. Avoiding overlaps in regional environmental matters (e.g., through effective division of tasks among different donors best illustrated by the Caspian Environmental Program) is the obvious first step in coping with the extra administrative workload. However, experience in the region suggests that this is a necessary but not sufficient condition of success in both national and regional projects. Effective coordination and cooperation are equally important. Avoiding overlaps cannot be a substitute for it. Effective coordination is much more difficult to achieve than non-duplication for it depends on factors such as personalities, much harder to control. The second step in dealing with the administrative overload is more effectively to separate strategy formulation on the one hand and its implementation on the other. In Central Asia, regional *implementation* (i.e., through rotation of executive committees of Inter-state Councils) has not worked particularly well while strategy *formulation* has. For implementation to be effective, it should be local. If such implementation is facilitated by additional authority provided by a supra-national body, so much the better.

C. Improved Monitoring

It is striking how weak the ability to measure sustainability remains"
(Esty (2001))

80. To say that environmental data in Kazakhstan are deficient is neither surprising nor original. Unlike in many other countries, environment-related information in Kazakhstan has deteriorated since independence, reflecting the sharp reduction in the funding of the monitoring network.²⁶ Modest attempts to remedy the situation have been financed by ADB, JICA, and attempts have also been made to generate data on newly emerging environmental priorities such as climate change,²⁷ but little other support has been forthcoming. The first and most pressing need, however, is not simply to restore the frequency and scope of former monitoring that once made the profusion of scientific information (to this day, 94 stations of KAZHYDROMET can differentiate up to 20 pollutants) a substitute for consultation and openness but to review the relevance of the information generated in the current circumstances and reform it in order facilitate their incorporation into the planning process and monitoring of stated priorities. Reform of the environmental data gathering is hampered by the deeply ingrained old habit of collecting information without asking fundamental questions about the reasons and benefit of this effort. The quantity of the data collected and available is far ahead of the capacity and readiness to analyze it and analyze it in a purposeful manner.

81. This is the background against which a new system of sustainable development indicators (SDIs) is to be developed as one professed aims of the Government under the ongoing Agenda 21. Kazakhstan has also announced the intention to adopt a Unified National Environmental Monitoring System (UNEMS) in line with such system being gradually adopted in some other FSU Countries. UNEMS focuses on:

- (i) setting up a core program of national monitoring;
- (ii) developing a framework for coordinated monitoring across all levels of government and supporting the developments at sub national levels; and
- (iii) prioritizing the establishment of greater co-operation and a better understanding between the various actors.

82. Elements of UNEMS were pilot-tested at the oblast level under ADB-financed technical assistance (TA 3350, see below) illustrating the scope that exists for a relatively low-cost improvement of local monitoring and for structuring the information system to serve the demands of the day.

83. The emergence of the civil society and its environmental NGO component has compensated for this trend only in part. There have been major improvement in the degree of openness and access to information on the part of the government but the rules and procedures of information disclosure have not been formalized.

²⁶ For instance, the number of stations monitoring surface water quality in Kazakhstan fell from 212 in 1990 to the low of 32 in 1999 before recovering to 96 a year later. The situation is similar for air quality monitoring.

²⁷ Carbon dioxide emissions are not measured at present, and as a result, industry (i) does not pay an emission charge for this pollutant, and (ii) has an incentive to keep CO₂ emissions out of the 'agenda' for fear of it becoming another one of the numerous air emissions for which they are charged. The situation is in stark contrast with the Government's official support of the Kyoto protocol and interest in the financial mechanisms under its umbrella.

D. Recommended Approaches to Promoting Sustainable Development

.....a clear switch from the shock therapy mindset of the nineties to the pragmatic approach of East Asian development strategies first pioneered in Japan and successfully followed by Korea, Taiwan, Malaysia and China. The real life experience calls for restoration of confidence in the Asian way, at least for Asians. [Agarwala (2002)]

84. Judging by the tone of *Strategy 2010*, something of a shift is taking place in the Government's view of economic development suggesting that a more interventionist ("East Asian") approach is now considered necessary to generate the growth and economic diversification. Much less has been said about the environmental dimension of the "East Asian way" and its "growth-now-clean-up-later" bias. Despite official statements in support sustainable development, the formulation and implementation of policies and mechanisms that would provide an adequate basis for dealing with past environmental excesses and safeguards against future ones have been slow in coming. Until now, the sustainable development rhetoric has run ahead of action, and the gap continues to grow. The many and diverse commitments of the Government to international and regional environmental conventions and agreements have ballooned in recent years while the capacity of the Government to meaningfully implement them has stagnated. The sustainable development agenda has been driven and largely financed by the donor community.

85. There is no shortage of recommendations in Kazakhstan about how best to deal with the situation. There are in fact too many recommendations, and this tends to obscure the essentials. The increasingly popular central recommendation to mainstream environmental concerns into economic policy and practice remains vague and begs more questions than it answers. The other central recommendation –hardly novel in a wide range of countries--is for the Government to increase the level of its financing of environmental priorities. The third central recommendation is to make environmental policy and practice in Kazakhstan more informed and supported by economics.

86. It is possible, based on what was said earlier on, to make several suggestions under each of the three broad headings.

1. Mainstreaming

87. It is proper to continue to probe the extent to which MEP can, and should, drive the process of environmental mainstreaming. MEP alone cannot achieve cross-sectoral integration in important environmental problems areas such as land degradation etc. Existing mechanisms (ministerial reviews or working groups) have not fundamentally changed the situation. Inter-agency committees either function in too specific areas (Kyoto Protocol) or are too new to provide lessons (e.g., IAC on Poverty). None of them have had sufficient or genuine input from the local administrative levels and the civil society. Support for new bodies with a broad mandate might be appropriate if there is a reasonable prospect of such arrangements fundamentally changing the mechanisms of allocating and using financial resources (see below) but probably not otherwise.

88. Key to the genuine integration is the willingness and ability of the Government apparatus to convert changed approaches to changed budgets. If environment is indeed best served by an integrated approach that offers multiple benefits, then budget allocations need to be made and labeled differently regardless of the formal assignment of institutional responsibilities for implementation. In an ideal world, institutions themselves would be organized by integrated

objectives (“poverty alleviation agency” etc.) rather than by sectors. In the world that refuses to be ideal it is important to extend the integrated approach gradually and pragmatically. In Kazakhstan, it might be possible, for instance, to further increase the role of selected river basin organizations as agents of integrated water and environmental management.

89. The complexity of mainstreaming places many obligations on different parties. It dramatically increases the need for broad-based local consultation (expensive in a sparsely populated country), it requires different information from that traditionally generated (equally expensive), it calls for different monitoring to say nothing of the need to further modify legislation, and many more. Not unlike state building, “mainstreaming” (the way it has come to be presented) is about everything, state building writ small but no less complex. The complex versions of sustainable development are inappropriate for Kazakhstan. They expect too much too soon and by overloading the local bureaucracy, they inhibit action.

90. The key to unraveling the complexity is to do useful things while mainstreaming is gradually taking hold. Targeting the proverbial “lowest-hanging fruit”, i.e. supporting activities that generate environmental improvement as a by-product of the main intervention, provides a powerful support to sustainable development and improves the readiness to embrace institutional change. A number of such opportunities exist, from dryland rehabilitation to upgrading of energy efficiency and many more. Some of these have been rightly seized by the Government and correctly targeted by IFIs and supported by international donors. The practice has shown that it *is* possible to design such projects and programs (1) with local participation; and (2) as a vehicle of broader local development, not just a sectoral one. There may well be situations where an “enriched sector approach” may be appropriate while in other cases, the same approach would be insufficient to tackle a multi-dimensional problem. Greater sensitivity to the differences of context is important.

91. Mainstreaming should be a tool of supporting the overarching objectives of the Government. The Government’s 2000-2002 Poverty Reduction Strategy and Program (PRSP), for instance, contains only a limited and unspecific list of environmental activities that could assist the task of poverty reduction. Yet, many excellent opportunities to link the two exist where income generation, environmental improvement, better health outcomes etc. can go hand in hand.

92. For integration to work, it has to have a substantial local input at the design stage. Local Agendas 21, to use the UN terminology, is what will ultimately count.

93. The strong verbal support for integration by most of Kazakhstan’s development partners has to be matched by an integrated nature of *their* environmental strategies and programs. For instance, a review of environmental financing in Kazakhstan is not merely a budget issue but also a governance issue and it needs to be approached in this way. If so, it would then be inappropriate for any assistance program separately to target (i.e. not integrate) support for environmental financing and, say, a reform of local financing. Similarly, support for greater policy coordination or strategic planning, a frequent component of IFIs’ assistance package typically directed at key economic ministries, should be made to embrace environment agencies also.

2. Financing

94. The discussion of environmental financing and its adequacy or otherwise has suffered from faulty methodology. The existing method of calculating environmental spending excludes

expenditures in sectors such as irrigated agriculture where livelihood and environmental benefits tend to coexist. The point is not to argue that environmental expenditure in Kazakhstan is adequate but to stress the need the count differently (and budget differently). “Non-integrated” data should not be used to make a case for greater integration.

95. It might be necessary to review the arguments used in debating the extent to which Kazakhstan’s environment is underfinanced because it is “mined” for general budget purposes. The cause for worry is not that the Government budget receives more “from the environment” than it spends on it (as it normally does in “one-mine-towns”), but that environmental degradation should be a source of government revenue (if the “town” does not spend money on mitigating the adverse impacts of the mine and where it does, it may do so inefficiently or non-transparently).

96. Concern about the levels of environment-related expenditure should not detract from continued attempts to increase the efficiency and effectiveness of environmental management in Kazakhstan. While the present staffing levels and experience of MEP are clearly insufficient to implement the demanding sustainable-development agenda, the cost effectiveness of existing environmental regulations and the instruments used have temporarily disappeared from the Government’s screen. They should not.

97. Potential availability of grant funding (e.g., through GEF) should not be the main driver of environmental mainstreaming or even of program and project design. The drivers should be the prospect of greater efficiency and cost effectiveness of a cross-sectoral approach in the former case and the existence of significant global benefits in the latter. The potential availability of grant funding should not skew the choice of interventions towards hard-to-implement alternatives.

98. The previous analysis suggests what the main components of a sound approach to environmental financing in Kazakhstan would be: (1) greater central and local budget allocations for MEP/*oblast* environmental bureaus (as an alternative to earmarking of pollution taxes) in line with improved ability of environmental authorities to formulate and justify “their” projects; (2) greater recognition of the indirect environmental impact of investments by ministries other than MEP that deliberately seek to maximize the positive environmental repercussions, and corresponding attention to scale and the design of such investments.;(3) need to review and strengthen the economic fundamentals of the pollution charge system (see also paras. 100ff below) ; and (4) improvement of natural resource pricing.

3. Economic Basis of Environmental Policy and Practice

99. In the midst of concerns about the lack of mainstreaming, it is important not to lose sight of the importance of getting the economic fundamentals of environmental policies right. Perverse incentives have not disappeared in Kazakhstan: cheap water leads to extension of irrigation into unsuitable areas, salinization and too much livestock. The “Washington consensus” in these matters should not be discarded lightly.

100. There is a pressing need to provide key economic and budget personnel with ammunition to revise the approach to environmental financing. The existing structure of social expenditure alone presents an opportunity to illustrate and quantify the linkages between environmental degradation and the financial burden on the government. The work should start here, before more complex activities such as introduction of environmental accounting or

environmental valuation are given a more prominent place. Eventually, however, such activities must be made an integral part of decision making in Kazakhstan. In Kazakhstan's case, this is particularly important given the importance of resource rents in the structure of GDP.

E. Regional Environmental Activities

101. At this stage, the transboundary dimension of many environmental problems of Kazakhstan need no repeating. Their existence and importance does not mean that improvement in environmental conditions in Kazakhstan is wholly outside the control of the Government. After all, these problems and their underlying causes have existed for a long time and river water allocations between upstream and downstream users have changed relatively little following independence (with the important exception of their seasonal distribution). Efficient responses to the Aral Sea crisis will combine sub-regional measures (e.g., improved deliveries of non-hydro energy to Kyrgyzstan in exchange for higher summer discharges from the reservoirs) and national ones (e.g. removal of infrastructural obstacles hindering Syr Darya's winter flows). The latter alone could generate improvements in the Aral Sea environmental disaster area. In this, Kazakhstan's situation is not very different from that found in many other parts of the world, industrialized or not, where environmental problems are exported or imported across national boundaries. The existence of transboundary effects does not immobilize national policy: it simply adds another dimension to it. Even if progress on water management turned out to be intractable there would remain many problems that have domestic origin and national impacts, demanding national solutions and implementation.

102. The importance given to regional environmental issues by the donor community tends to outpace the attention to national problems. This is understandable for cooperation and orderly pattern of conflict resolution are valued *per se* and right now, possibly valued more by the outsiders than by the countries concerned. There is every indication that the "disproportionate" attention to the regional environmental issues will continue. There may be nothing wrong with this provided the implementation of regional environmental initiatives recognizes the imperfect fit right now between donors' priorities and local priorities. This is increasingly acknowledged by the donor community. UN SPECA has gone the furthest (and possibly a little overboard) in calling for regional environmental problems to be tackled by addressing national priorities.

103. Interstate cooperation of CARs based on regional institutions and programs such as the Aral Sea or the Caspian Environmental Programs has proven relatively ineffective as none of the institutions (IFAS, ICWC, ICSD, CAEC, basin water organizations, and others) fully integrates the conflicting interests. The positions of national governments show no signs of softening, deteriorating water delivery infrastructure threatens agreed water deliveries, and reforms in related areas²⁸ add to the underlying complexity. This experience therefore does speak in favor of endorsing a more realistic—even if sub-optimal—approach to the complex transboundary in which sub-regional activities are driven by national needs and perceptions of such needs. For regional cooperation to succeed, even a strengthened ICWC will not succeed unless its (or some other organization's) mandate incorporates the interests of *all* principal users of the basin water, from the power sector to habitat conservation interests. For now, the existing interstate bodies created can probably best be used to enhance the prospects of national implementation by providing additional authority, not by formulating goals that are not fully endorsed at home.

²⁸ For instance, the privatization of coal mining in Kazakhstan makes potential coal exports to upstream countries a strictly business proposition.

104. Formulation of an environmental strategy needs to recognize Kazakhstan's unique features while drawing on similarities among the FSU and NIS countries. Substantial amount of work on the typology of environmental status supported by a variety of indicators (such as environmental sustainability index, environmental performance index, human development index etc.) has recently been undertaken worldwide to facilitate cross-country comparisons. This work is important for Kazakhstan and its development partners to monitor and its elements possibly adopted. The work introduces a disciplined approach to the evaluation of environmental performance. Its limitations, however, should also be borne in mind. The first is the reliance on aggregate data. In environmental management where spatially differentiated impacts are common, this reduces its value. Secondly, very similar environmental sustainability scores for all five CARs obtained by the better known among the cross-country studies²⁹ hide substantial policy-relevant differences (see Table 2 below). It is these (and other) elements that provide an argument for not using a common approach to environmental management in all CARs, especially where stand-alone environmental technical assistance is concerned.

Table 2. Main Elements of Uniqueness of Kazakhstan Relevant To Formulation of Environment-Related Interventions

Item	Specific Features of Environmental Policy Distinguishing Kazakhstan From One or More CARs
Climate and topography, especially with respect to arable land	<ol style="list-style-type: none"> 1. Management of the steppe at the forefront. Reducing and rehabilitating area inappropriately cultivated among key environmental concerns. 2. Management of hilly and mountainous landscapes less important at the national level. 3. Spatial impacts of resource mismanagement (e.g., Aral Sea) unusually wide. 4. Extremely low population density in rural areas make public health improvement there costly and affect the economic viability of rehabilitation investments.
Role as wheat exporter	Pits environmental concerns (item 1. above) against emphasis on production.
Per capita income and its distribution	Facilitates cost recovery in energy, water and environmental services provision.
Importance of industrial activities	<ol style="list-style-type: none"> 1. Industrial pollution control and energy efficiency become important policy priorities. 2. Past experience in managing industrial pollution provides a head start in policy innovations 3. Availability of industrial and technical skills facilitate technology-based approaches to environmental management but can inhibit incentive-based approaches 4. Tends to give environmental policy an urban bias.
Importance of coal and hydrocarbons	<ol style="list-style-type: none"> 1. Pattern of coal use and management of air quality increase in importance. 2. Increases the profile of activities related to global warming. 3. Work on natural resource pricing acquires special importance.
Balance between past and current problems	High share of "old" waste. Raises the importance of work on environmental liability, feasibility of waste re-cycling, and CERCLA-type remediation schemes.
Culture, traditions	<ol style="list-style-type: none"> 1. Though imperfectly, Western approaches to environmental management find a receptive audience and often serve as a benchmark.³⁰ 2. "Russian" life style increases health risks during economic transition and raises the importance of health-driven approaches to environmental management

²⁹ See the list of references.

³⁰ Not for nothing (and not perhaps only because of the large Russian population in Kazakhstan) were the countries of Central Asia referred to as "Kazakhstan and Central Asia" during the Soviet days.

IV. ADB APPROACH AND PROGRAM

A. ADB Experience and Comparative Advantages

105. Improved environmental and natural resource management is considered by ADB as one of the pillars of achieving the goal of poverty reduction and sustainable growth in all Central Asian DMCs, including Kazakhstan. In ADB's lending to Kazakhstan so far, environmental concerns have been addressed, first, through EIAs and, second, through projects or programs in sectors with significant environmental linkages, namely agriculture, water supply, and energy, rather than through projects that would have environment as an explicit thematic objective.

106. ADB environment-oriented operations in Kazakhstan gained in prominence once the scale of environmental threats became better understood and institutional collaboration and co-financing possibilities in Kazakhstan more fully explored. *Environmental Profile of Kazakhstan* commissioned by ADB in 1994 was the first baseline analysis of environmental challenges there. Thanks in part to grant support by the Finnish and Swiss Governments, ADB's technical assistance has targeted capacity building at the ministerial level, selected environmental or natural resources management problems as well as regional cooperation in environmental matters. The environmental component of the Bank's technical assistance to Kazakhstan is summarized in Table 3 below. Several other advisory TA projects (e.g., those strengthening market reforms in agriculture) have contributed to environment policy development indirectly (see Appendix D)³¹.

Table 3. ADB TA Activities with Direct Environmental Objectives

TA Number and Type	Title	Year	Amount (\$'000)
2262, PP	Almaty Air Quality Study	1994	100
2366, PP	Rehabilitation of Almaty No.1 Heat and Power Station	1995	556
2677, PP	Water Resources Management and Land Improvement	1996	100
2964, AO	Institutional Development and Policy Reforms for Improved Water Management	1997	600
3350, AO	Strengthening Environmental Management	1999	700
5860, RETA	Institutional Strengthening and Collection of Environmental Statistics	1999	500*
5878, RETA	Regional Cooperation for Sustainable Mountain Development in Central Asia	1999	380
5934, RETA	Regional Environmental Action Plan (REAP) in Central Asia	2000	500
5941, RETA	Combating Desertification in Asia	2000	450
5972, RETA	Promotion of Renewable Energy, Energy Efficiency and GHG Abatement Projects (PREGA)	2001	5,000*
5996, RETA	Ten Years After Rio: Promoting Subregional Cooperation for Sustainable Development	2001	200
6001, RETA	Regional Consultations for the Third World Forum	2001	1000*
, RETA	Assessment of Sub-Regional Water Management Issues in Central Asia	2003	150

* The share of CARs was smaller than the RETA totals indicated in the table.

³¹ Table 3 does not include a dozen or so post-1995 RETAs that can –and should—be considered to support environmental management among DMCs through targeting areas as diverse as resource pricing, natural resource management, urban development, dryland agriculture and others. Participation of CARs governments in these activities varied. The fact that these RETAs are rarely considered as having a close link to environmental management is indicative of incomplete mainstreaming inside ADB.

107. The experience of TA 3350 (see Table 3) is particularly relevant. Its terms of reference directed it to addressing four areas of recognized weakness, i.e., (1) environmental legislation and regulations; (2) market based policy measures; (3) environmental monitoring; and (4) pollution prevention and clean technology policies and guidelines. Furthermore, the TA project was implemented at the *oblast* level generating good insights about the way the changing policy environment influences the performance of the environmental regulator in the field. The main findings and lessons were the following:

108. On capacity building:

- (i) Local government departments in Kazakhstan, even if fully committed to environmental change, need continuing confidence building in realizing environmental goals. Projects such as TA 3350 help to bolster the status and of these organizations and their confidence and ability to support the programs developed by the Ministry as well influence policy making in the center.
- (ii) The 'top-down' genesis and management of the NEAP has resulted in skepticism at the *oblast* level of the direction and the value of the NEAP. Furthermore, NEAP as well as many other policy documents dominating the debate in Astana (and Almaty) are poorly known at the local level. NEAP objectives cannot be converted into programs without considerable inter-departmental coordination at the local level. Before policy can be developed it needs to be disseminated, applied, and its shortcomings, if any, analyzed. Capacity strengthening and institutional development are required not only at the central level but also (and mainly) in *oblasts'* environmental departments.
- (iii) Capacity strengthening support and its focus so far on the central tier of the Government tend to make it too theoretical and not directly related to the specific needs of the institutions. At this stage of institutional and policy reform in Kazakhstan, an approach based on hands-on local training yields better results.
- (iv) Improving the basis for liaison and data exchange among agencies at the local level, as well as with enterprises that are regulated by the *oblast* agencies is important and funding of such efforts can produce good results.
- (v) Capacity is built when support is given to institutions and personnel at their location of work, rather than in a remote classroom or conference facilities.
- (vi) Sustained capability of local staff to better manage the environment is best created by also involving agencies other than MEP (such the Hydrometric Agency, the sanitary epidemiological organization, the Ministry of Agriculture, and others) in any capacity building program.

109. On legislative and regulatory development:

- (i) At present, *oblast* staff and others are more inclined to await detailed instructions in the form of normative documents rather than to develop methodologies that would be incorporated into legal documents.
- (ii) For environmental legislation to be effective, its design and drafting requires appropriate policy inputs. In the case of waste management legislation, specifically studied under the TA, there are a number of references to waste in the various policy documents including the NEAP, but there is no formal state policy on the waste sector. It is important to develop a national strategy for waste management of past and current waste. A full consultative process addressing the practical economic, scientific, financial factors (rather than a narrow reliance on legislative drafting skills) needs to precede the enactment of new laws.

- (iii) Effective implementation of laws requires shared, consistent and reasonably complete information. In the case of waste disposal, these conditions are not met. The municipalities, the *oblast* Environment Agencies and MEP do not maintain an inventory of waste disposal sites either nationally or at local level. The information held by the local Environment Agency regarding waste disposal sites is not collated in a single register and information on waste disposal sites is not readily accessible. Different divisions of the same local Environment Agency have some responsibilities for industrial waste and no one agency has overall responsibility for waste management.

110. On economic instruments:

- (i) The pollution charges have been used in Kazakhstan mainly as a revenue-raising device, not an instrument of environmental policy. This should change³². The mechanisms of reinvestment of pollution charges for environmental purposes need to be strengthened. MEP and its local agencies need to have greater ability to formulate worthwhile environmental projects in order to fully justify necessary allocations from the regional environmental funds administered by local treasuries.
- (ii) For the time being, the majority of local officials have insufficient economic and information technology background to effectively administer more complex economic mechanisms such as emissions trading. In the specific example of carbon permit trading, piloted under the project, there is, in general, a lack of interest in GHG mitigation at the level of industry. Local officials tend to be unaware of the international communities concern over climate change, or of the Government's intentions in relation to the Kyoto Protocol. If industry is to be encouraged to consider GHG mitigation measures, dissemination of Government policy in the area of climate change must be improved.

111. On environmental monitoring:

- (i) Existing approaches to data collection and environmental monitoring need to be improved, particularly with regard to the compatibility, comparability, reliability and accessibility of data, by linking various sectoral networks and extending their spatial coverage into an integrated monitoring system. Critical issues requiring attention include the number and distribution of monitoring sites, the balance between ambient and point source monitoring, determination of the key parameters required for effective monitoring and reliability of the data generated by monitoring stations. The potential for cross-media and multiple exposure monitoring should be assessed.
- (ii) Other possibilities include the use of environmental audits of firms' performance and independent monitoring by enterprises and research institutes. To make the monitoring system more cost effective, sample surveys should replace the more costly census methods for preparing state of the environment reports. This will require training.

³² TA 3350 has come out in favor of earmarking of pollution revenue for environmental purposes. ADB's experience elsewhere in Asia and experience in NIS and other transition economies of pollution revenue earmarking has been mixed. This CEA reflects that position.

- (iii) Industry is the main provider of data to the local environmental agencies. Under existing legal requirements, data gathering is complex, its scope excessive and the information heterogeneous. The demands on the industry can be reduced while clarity and consistency of the data is improved. A new data management regime should be created and imposed on the industry in pilot locations first.
- (iv) It is possible, with additional support, to develop a risk based monitoring system that combines ambient-, impact- and epidemiological monitoring to establish links between human health and anthropogenic activities.

112. On pollution control and cleaner production:

- (i) Most industry and governmental leaders, educators and citizens are unaware of the concept of CP and its potential economic and environmental benefits. Where the term makes an appearance in Kazakhstan, there is a tendency to equate it with waste minimization, rather than in a wider sense that stresses the changes of management approach.
- (ii) Approvals of industrial projects, determination of emission limits and inspections tend to be implemented in separation. This inhibits the introduction of cleaner technologies.
- (iii) The pollution limits should be based on the Best Available Technology (BAT) approach, not on norms that do not reflect the development of new technologies.
- (iv) CP should be given legal status within Kazakhstan and a national CP program should be formulated. Much more CP capacity is needed in universities and CP Centers.
- (v) There are no obvious solutions to the problem of the impacts of historical environmental “misdemeanors” such as dumps of sometimes contaminating waste. Reprocessing of old waste may require high levels of financial subsidies. Furthermore, evidence demonstrating contemporary impacts and high risks is seriously incomplete and developing it is likely to be costly. The management of *contemporary* pollution holds a much greater promise.

113. Work on voluntary environmental certification (ISO 14000), environmental audits and standards on qualification criteria of auditors, currently conducted by the North Kazakhstan University, should continue.

114. Environment management insights and impacts emerge from other ADB-funded activities. One of eleven stated objectives of the Agricultural Sector Program (Loan 1406-KAZ) was to assist sustainable management of the environment and agriculture. Kazakhstan joined FAO in 1995 and shortly thereafter committed itself to pesticide-use reporting requirements under the FAO-sponsored international code of conduct in pesticide use. Severe decline in the use of fertilizers and agrochemicals in the wake of the contraction of agricultural production has lowered the priority given to this matter. It is important to keep the potential risks in mind as the sector is beginning make a slow recovery and as temporary concerns (such as locust infestation) recede.

115. TA 2448 (Study of the Market Reform in the Agriculture Sector) provided policy recommendations for the use of rangelands. In this case, the follow up actions were not undertaken as priorities were placed elsewhere, mainly on restructuring of the sector and rehabilitation of the irrigation infrastructure.

116. Under TA 3633 (Urban Small Business Development) a review of environmental issues concerning SMEs in Kazakhstan was undertaken and several environmental audits prepared to serve as a concrete starting point for conducting an IEE of the new project proposal under possible future ADB credit line project. A model environmental audit report pro forma for participating banks was also prepared as were sample Environmental Policy Statement and formats of Environmental Due Diligence (EDD) procedures. EDD is to be integrated into the participating bank's routine credit appraisal, i.e., treated in the same manner as financial, technical and legal due diligence.

117. Environment-related and public health measures are the focus of JFPR grant-funded project Low-cost Sanitation, Hygiene and Sanitation Education, approved jointly with the Rural Water Supply and Sanitation Sector Project. It is an example of how environmental and public health objectives can be worked into a rural development project with a sub-sectoral (in this case, water supply) focus.

118. RETA 5860 helped assemble environmental statistics for the entire transition decade 1990-2000. While valuable, the activities financed were *ad hoc* in nature rather than triggering off fundamental changes in the way environmental data are collected and analyzed.

119. RETA 5878 (Regional Cooperation for Sustainable Mountain Development in Central Asia) avoided the complex transboundary trade-offs of the kind that dominate the issue of water management and tackled instead problems shared equally by all countries concerned. The factor that made it easier to implement may have reduced the RETA's impact somewhat in Kazakhstan where –unlike in Kyrgyzstan and Tajikistan– the most telling environmental problems are not found in the mountains.

120. Other RETAs are too recent to confidently draw conclusions. Worth mentioning nevertheless is RETA 5972 (PREGA) where poor supervision by the Bank resulted in the need to compensate GOK for expenses incurred in good faith to implement a hastily conceived technical assistance proposal on rural energy, later abandoned. The experience undermined (temporarily, it is hoped) the Government's readiness to consider collaboration with ADB on renewable energy projects.

121. An internal ADB review of its portfolio performance in Kazakhstan noted that, in general, absorptive capacity in Kazakhstan remains limited. Project management skills remain weak and frequent restructuring of government agencies and fast turnover of Government staff result in inadequate familiarity with ADB's operational policies and procedures. Language barriers also exist. To varying degrees, all of these have affected also the environmental portfolio. Viewed from the Kazakh side, over the past seven years, ADB has not always used its funds (especially TA resources) effectively because it did not understand or acted upon the importance of timing and phasing of TA activities in line with Government task setting.

122. Two other overarching lessons emerge: First, "ownership" is key to the success of technical assistance. Inadequate ownership affects project selection, design and implementation. TA design in Kazakhstan continues to be ADB-driven or largely reflects the preferences of one government agency's plans without adequate prior inter-agency discussion and consultation with those who are meant to benefit the most. As a result, projects often suffer from insufficient involvement of stakeholders, lack of commitment from executing agencies, and lack of provisions for continued efforts once TA projects are formally completed.

123. Second, and not only in Kazakhstan, a project-based approach has tended to prevail over a programmatic one. Yet success of projects addressing environmental and natural resource management depends not only (or even mainly) on technical support, design and installation of physical facilities but on policy, legal, financial and institutional mechanisms, and interaction among environmental departments, other key government agencies and the civil society. This requires a program-based approach, not a project-based one. ADB's assistance in Kazakhstan has rarely done this, i.e. targeted the policy and legal framework, and instead focused on capacity building at environmental departments. While several regional TA initiatives attempted to address key environmental issues in a cross-sectoral manner (e.g., the formulation of the regional environmental action plan), this has been an exception within the national context. For technical assistance to have a lasting effect, identification of priorities and design must be guided by a program framework and a strategic vision and be supported by a sense of partnership and continuity at present insufficient. Whether ADB has the capacity to "service" a program-based approach remains in doubt, however.

1. ADB Comparative Advantage

124. The doubts mentioned above notwithstanding, ADB can bring not only technical and institutional expertise to Kazakhstan but also experience potentially invaluable to a young transition economy such as Kazakhstan. Environmental management is no exception and ADB's involvement in environmental management in different types of reforming economies holds lessons for Kazakhstan. In terms of specific areas of environmental management expertise the following are of greatest relevance to Kazakhstan: (1) Institutional strengthening: ADB has had a substantial involvement in a number of environment and cross-cutting issues involving environmental management in its DMCs. In a number of countries, its traditional support for the development of the environmental (EIA) review and monitoring structures and capacity has been followed by support for incentive-based approaches to environmental management and sector-wide realignment in pursuit of selected environmental goals (e.g., air quality management in chosen air-sheds). (2) Water resource development and management: ADB has vast experience in irrigation rehabilitation and management, water supply and wastewater management. Its work on water pricing is particularly relevant to Kazakhstan. (3) Land degradation, erosion control: Here, ADB can bring to Kazakhstan the highly relevant experience of Western China and other parts of Asia. (4) Energy efficiency and environmental improvement: Traditional area of ADB involvement with substantial experience of institutional reform, system rehabilitation and upgrading, tariff policy, pollution control and, increasingly, renewable energy. (4) Regional environmental cooperation: Considerable experience of transboundary environmental effects and their management exists. Some of this experience is based on activities already financed in the region. While ADB has not been directly involved in sub-regional environmental programs such as the Aral Sea or Caspian Environmental Programs, it has taken lead in other such programs (such as mountain ecosystems) as well playing a central role in the preparation of the Regional Environmental Action Plan. In addition, ADB can draw on substantial experience of other regional initiatives such the Greater Mekong Sub-region (GMS) Program where environmental considerations played a major role. A separate regional environmental assessment is now being completed dealing solely with regional aspects. This should be read jointly with the present document.

125. It would be unwise, however, to regard the breadth of ADB involvement in environmental management activities of ADB's member countries as always leading to a smooth unidirectional building of the Bank's own capacity. A more realistic assessment would take into account some forgetting taking place alongside learning, loss of institutional memory through staff turnover and

multiplying administrative workload, and policy meanderings. All of these play a role. They do not diminish the role ADB can play in its client countries but emphasize the need for periodic reassessments of ADB's own capacity, especially if ADB assistance is to have a greater program-oriented, rather than project-based, content.

B. ADB's Environment Strategy and Work Programs

126. Promotion of sustainable economic growth has long been at the center of ADB's mission. However, growth alone—even a sustainable one—will not necessarily reduce poverty (“lift all boats”). It needs to be broad-based (not entrepot-based, a constant danger in resource-rich countries like Kazakhstan), and generate employment and incomes, especially among the poor. A more explicit focus on poverty alleviation forms the basis of the current ADB policy, the central objective based on the pillars of (1) pro-poor, sustainable growth, (2) social development, and (3) good governance.

127. The above logic is reflected and adapted to environment in ADB's 2002 Environment Policy that has five main elements: (1) Promoting environmental interventions to reduce poverty; (2) Mainstreaming environmental considerations in economic growth; (3) Maintaining global and regional life support systems; (4) Building partnerships; and (5) Integrating environmental considerations into ADB operations. We shall refer to these as *elements* 1 to 5. Each of the five elements is translated into several *areas of concern*. The elements and areas of concerns are related as follows:

Element 1: Environment interventions for poverty reduction

- Area 1: Protection, conservation and sustainable use of natural resources
- Area 2: Environment quality improvement
- Area 3: Reducing vulnerability to natural hazards and preventing disasters

Element 2: Mainstreaming environmental considerations in economic growth

- Area 1: Policy integration
- Area 2: Integrated economic and environment development planning
- Area 3: Strengthening regulatory systems and environmental governance
- Area 4: Market-based instruments and other policy instruments
- Area 5: Promoting education and public awareness

Element 3: Maintaining global and regional life support systems

- Area 1: Responding to multilateral environmental agreements
- Area 2: Supporting regional and sub-regional cooperation on environment

Element 4: Building partnerships

Element 5: Integrating environmental considerations into ADB operations

- Area 1: Country environmental analysis
- Area 2: Appropriate classification of loans
- Area 3: Public consultation and information disclosure.
- Area 4: Implementation and monitoring and evaluation
- Area 5: Environmentally responsible procurement
- Area 6: Performance-based allocation of ADF resources

128. An environmental strategy for a country will be a particular selection of these components and an emphasis given to each, both decisions reflecting the analysis of the

underlying conditions of the country in question. It will be accompanied by recommended approaches to implementation.

129. The recommended strategy for Kazakhstan, using the format of the ADB Environmental Policy is given in Table 4 below:

Table 4: Environmental Strategy for Kazakhstan

ADB Environmental Policy Elements and Areas of Concerns to be Given Prominence	Justification of the Selection and Emphasis	Recommended Approach to Implementation
Element 1: Environment interventions for poverty reduction		
<p>General</p> <p>Area 1: Protection, conservation and sustainable use of natural resources</p> <p>Area 2: Environment quality improvement</p>	<p>ADB's approach to environmental management must be guided by its implications for poverty. In Kazakhstan's conditions, it means that it will have a rural focus for it is there where poverty is most acutely felt.</p> <p>The strong environmental content of rural development and water management in Kazakhstan makes these two a particularly important sector element of the environmental strategy.</p> <p>Deterioration of public health infrastructure (water supply, peri-urban waste mgmt., etc.) is a major factor influencing livelihoods and its should continue to be targeted by ADB.</p>	<p>ADB's environmental interventions have to be effectively grafted onto income-generating activities while ensuring –as cheaply as possible-- that greater incomes are not achieved at the cost of environmental degradation. Selection of environmental interventions should start from the identification of win-win opportunities before considering other components.</p> <p>Positive experience in water management and the scale of unfinished agenda speaks in favor of continuity and project "repeats" (with small modifications).</p> <ul style="list-style-type: none"> - Activities in "new" basins (e.g. Illi-Balkhash) should take place only where the involvement is likely to be large enough to make an impact. Co-financing may become necessary to obtain the critical mass. <p>New investment must be preceded by a policy review. Right policy –i.e. one that promises to be sustainable-- must be in place. This is so, for instance, in relation to the management of current and past waste or renewable energy promotion.</p>
Element 2: Mainstreaming environmental considerations in economic growth		
<p>Area 1: Policy integration</p> <p>Area 2: Integrated economic and environment development planning</p> <p>Area 3: Strengthening regulatory systems and environmental governance</p>	<p>Insufficient mainstreaming of environmental concerns into economic activities is a widely recognized central weaknesses of the current policy and practice.</p> <p>Awareness of the importance and social profitability of sustainable development is needed also at <i>akimats</i>, not only in Astana or Almaty.</p> <p>Environmental financing, especially at the local level, is unclear, non-transparent and likely inefficient.</p>	<p>Over-ambitious variants of mainstreaming are too demanding administratively and should be avoided in favor of simpler linkages. The mainstreaming must be supported by clear explanation of the economic and financial benefits this is expected to bring.</p> <ul style="list-style-type: none"> - Particular attention is required to improve the ability and role of <i>local</i> bodies and citizenry in influencing environmental policy and investments. - Ensure linkages with any ADB support for improving programming capacity of GOK. - Ensure that ADB activities are aligned within the priorities of NEAP. <p>Work on environmental financing ought to be closely linked with support that ADB may be considering for local financing and its reform.</p>

Element 3: Maintaining global and regional life support systems		
<p>General:</p> <p>Area 1: Responding to multilateral environmental agreements</p> <p>Area 2: Supporting regional and sub-regional cooperation on environment</p>	<p>Transboundary impacts, especially those related to water use and management, are a major factor influencing env. management</p> <p>Continued support needed to bridge the gap between the obligations assumed by GOK and capacity to meet them.</p> <p>Regional and sub-regional cooperation on environment</p>	<p>Strengthen the links with the international environmental conventions in Kazakhstan as a condition of preparing better candidates for GEF co-financing.</p> <p>Seek more actively and less conventionally than up to now grant and concessional co-financing for environmental activities.</p> <ul style="list-style-type: none"> - Structure assistance within the priorities of sub-regional and regional environmental programs such as the Aral Sea or Caspian Sea Programs and REAP. It is less important to wait for these sub-regional programs to work smoothly as a condition for ADB's initiatives. - Recognize that many regional environmental problems (especially in water management) are governance issues more than technical ones. - Transfer experience in regional cooperation from other regions such as GMS but keep in mind the differences between Central Asia, newly emerging and still solidifying national structures, and the cooperation frameworks such as ASEAN that emerged more gradually. - In regional environmental matters, "strategize" at the regional level but implement locally. Regional environmental cooperation should be driven by internal need - Align activities internally and strive for greater unity of purpose in regional initiatives among different units of ADB (see also under Element 5)
Element 4: Building partnerships		
<p>General:</p>	<p>Partnerships have proven indispensable to get things done in the environmental domain.</p>	<p>Continue developing the key environmental partnerships such as the UNCDD Global Mechanism or ADB/UNDP/UNEP; Consider new ones.</p>
Element 5: Integrating environmental considerations into ADB operations		
<p>General:</p> <p>Area 1: Country environmental analysis</p> <p>Area 6: Performance-based allocation of ADF resources</p>	<p>Country programming has made little of the link between environmental conditions and poverty incidence in Kazakhstan</p> <p>In Kazakhstan and Central Asia, a particularly complex and important relationship between water and energy management exists, demanding close coordination inside ADB</p>	<ul style="list-style-type: none"> - Preparation of PRPA should have a firmer basis in the relationship between environmental degradation and poverty. - Poverty assessments need to explicitly address the question of rural re-settlement rather than avoiding it. - Better coordinate regional activities involving water and land management now divided among ECAE, ECOC (CARECU), ECSS and RSAN (and possibly also ECIF and RSES) - One environmental strategy formula—and one type of CEA—does not fit all countries of Central Asia. <i>Inter alia</i>, Kazakhstan is more industrialized, more diverse, richer (on average), and more reform-minded than most of her neighbors but also more polluted or threatened, and has lower life expectancy. - CEA should not be the sole analytical effort in "environment". Strategic environmental assessments may be required especially on

	<p>Technical assistance should be provided only where capacity lacunae threaten the implementation of ADB projects and programs or where ADB assistance leverages funded activities of the Government or other lenders or donors.</p>	<p>water-energy management.</p> <p>ADB should consider making advisory and operational technical assistance performance-based in tandem with pooling AOTA resources for the CA and NIS region with possibilities for re-allocation of funds within this area.</p>
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A few additional observations may be relevant:

130. Within the relatively small overall ADB assistance program in Kazakhstan, it may be necessary for the assistance to have a geographical focus. However, the geographical focus should not be driven mainly by finding “unrepresented” (donor-wise) areas but by reference to the potential benefit of the intervention under consideration given the scale of existing investment commitments by others. Certain areas (e.g. irrigation rehabilitation) may be “crowded” but this may be so for very good reasons. What becomes important then is not to avoid the crowd but ensure that good coordination exists with the parties already engaged.

131. “Unsung” environment-related activities of ADB (e.g. the work done on environmental due diligence by SMEs, the indirect impact on the pesticide use) should not fall through the cracks of the institutional-memory floor. If they do, this should be used it as an opportunity to evaluate the usefulness of past assistance and draw lessons for the future. Other results (e.g. those of TA 3350) would deserve to be given more prominence. A period of stocktaking may be needed. With a gradual shift of environmental assistance away for Kazakhstan towards the poorer countries of Central Asia the flow of new initiatives may begin to slow down in Kazakhstan providing an opportunity for much needed reflection.

132. Below, the environmental strategy of Table 4 is supplemented by more specific suggestions of the projects and activities that could constitute an ADB environmental program. Each of the specific suggestions given below responds to the strategic emphasis by filling a gap in past programming, building on demonstrated successes, or supplementing existing assistance plans. These opportunities are divided according to whether they are advisory/cross-cutting in nature or are expected to lead to direct investments (loans).

1. Institutional and Policy Support (AOTA) Opportunities

a. Priority 1: Environmental Governance I: Environmental Management at the Local Level and Other Policy Support

133. The experience of TA 3350 (Strengthening Environmental Management) was mixed, its emphasis on local capacity creation its main strength but the task far from finished. These activities, targeting the local environmental agencies in the administrations where ADB investment programs are being implemented or considered, deserve to be resumed. Among possible areas of assistance is creation of mechanisms for efficient use of the pollution charge revenues accumulated in the local budgets and any other resources for the task of local environmental management. Among other things, this calls for the development of local skills in project formulation and evaluation, and improvement of local co-ordination and consulting mechanisms. Environmental investments should be seen as an aspect of local financial management, an area agreed by most to require further strengthening;

134. Other areas of institutional and policy strengthening where ADB support might be worthwhile include: (i) formulation of the policy and regulations on the use and pricing of natural resources. Legislation in this area is under preparation but its economic basis appears weak. If mobilized soon, technical assistance could ensure that a sound policy is adopted right away rather than revisions becoming necessary prematurely. The policy finally adopted will have repercussions on local environmental financing and therefore reinforces the activities described in para. 129; and (ii) formulation of policy for dealing with historical wastes addressing the issues of liability for past environmental degradation, the priority given to remediation measures and their financing.

b. Priority 2: Environmental Dimensions of Rural and Water Sectors

135. Water management and rural development have been the priority sectors for ADB (see Appendix C) as witnessed by Loans 1592 and 1593 (Water Resources Management and Land Improvement Project), Loans 1779 and 1780 (Farm Restructuring Sector Development Program) and TA 2946 (Institutional Development and Policy Reforms for Improving Water Management). After a brief period of separation, the two sectors are administratively linked, the Water Resources Commission having been re-absorbed into the Ministry of Agriculture. An increased amount of analytical work is noticeable in the water sector, in part reflecting the efforts preceding the 2003 drafting of a new Water Code. Once enacted, the Code will remove a number of policy weaknesses and obstacles. Nevertheless, more support may be needed, especially in making river basin organizations more effective vehicles of co-ordinated water and environmental management, and in strengthening the local capacity to formulate interventions that maximize the synergies potentially present.

136. Land degradation and desertification: Support to the Strategic Partnership for Implementation of UNCCD in the Central Asia Subregion (Regional). Projects implemented by ADB in Asia (in particular TA 3497-PRC: GEF Partnership on Land Degradation in Dryland Ecosystems and TA 3657-PRC: PRC-GEF Partnership on Land Degradation in Dryland Ecosystems) have generated good appreciation of the principal desertification issues in the semi-arid parts of Asia. ADB RETA 5941 (Combating Desertification in Asia) has extended these efforts into Central Asia. As an active participant in UNCCD-related activities in Asia, ADB contributed to the creation in 2002 of a Strategic Partnership for the Implementation of UNCCD in the Central Asia Subregion. This provides a coherent platform for the mobilization of resources for UNCCD in Kazakhstan and elsewhere in Central Asia. The Government and ADB

can begin to program more specific technical assistance and investment projects. The local capacity to develop investment projects that directly address land degradation issues, however, is limited for the time being despite the experience obtained (also by NGOs) in the course of implementation of several donor-funded projects. ADB support could be phased in first as technical assistance to improve local capacity followed by investment support for concrete investment projects (see below).

c. Priority 3: Environmental Governance II: Development of Institutional Mechanism for Cross-Sectoral Coordination and Cooperation

137. Following Kazakhstan's participation at the 1992 Johannesburg (WSSD) Summit, the Presidency decided to step up its support for mainstreaming of environmental development. A decision was taken to establish a multi-agency National Commission for Sustainable Development as a principal body driving inter-agency collaboration and generate synergies in environmental management in Kazakhstan. At present, the Commission's terms of reference and necessary administrative arrangements are being formulated. ADB earlier institutional support (TA 3350) as well the institutional aspects of its regional environmental technical assistance (RETAs 5878, 5934 and 5941) have given the Bank a stake in further institutional strengthening. Subject to the Commissions' mandate being reconfirmed and realistic terms of reference agreed, ADB's support for the emerging National Commission could improve the integration process.

d. Priority 4: Concerted Approach to River Basin Development (Regional): Kazakhstan-China Partnership on Joint Management of Transboundary Waters

138. ADB has played an important role in encouraging regional economic and environmental cooperation. Management of joint water resources has dominated the regional agenda. So far, the emphasis has been on the Syr Darya and Amu Darya basins and much less so on the Irtys or Illi basins. In the latter two cases, the rivers originate in China and no programs exist that would coordinate water quality control or watershed protection activities in China with those of Kazakhstan. Yet possibilities exist of forging a cooperation framework and seeking donor financing, including that of GEF.

2. Investment Opportunities (PPTAs and Loans)

a. Efficiency in Water Resource Utilization: Second Water Resources Management Project and Land Improvement

139. A concrete proposal has been formulated by ECAE, backed by positive experience with an earlier similar project. Second Water Resources Management Project would maintain its emphasis on integrated river basin management and the role of agriculture and irrigation practices within it. Rehabilitation of irrigation and water resources infrastructure would be undertaken in different locations of the Aral Sea Basin that combine the imperatives of basin-wide management and the need to improve land use practices with all the anticipated environmental and livelihood-enhancing benefits.

b. Land Degradation and Desertification: Investment Support for Activities Identified Under the Strategic Partnership for Implementation of UNCCD in the Central Asia Subregion (Regional).

140. The contents would be the logical extension of the technical support under its regional component described above. Linkage or merging of this and another Priority 2 proposal (rural area development) component deserve to be considered. Among the priorities to be addressed are (i) monitoring and assessment of desertification processes and environmental impact assessment; (ii) improving the use of water in agriculture; (iii) combating erosion, salinization and swamp formation; (iv) agroforestry and forests resources management on the plains and in the mountains; (v) watershed management; (vi) rangeland management; and (vii) nature and biodiversity conservation; and (viii) ecotourism development.

c. Improved Public Health and Poverty Reduction: Second Rural Water and Sanitation Project

141. In rural areas, poor quality of drinking water is a major livelihood and environmental concern and ADB should tackle it head on. Once more building on a previous project (now in the final stages of approval), Second Rural Water Supply and Sanitation Project could be formulated under which new water supply systems would be provided to more communities and existing systems reconstructed in other communities in oblasts with demonstrated need and (such as North Kazakhstan, Akmola, Karaganda and South Kazakhstan).

d. Rural Area Development Project(s)

142. A number of rural development projects with a significant environment- and poverty alleviation dimensions are possible to address, besides other concerns such as dryland rehabilitation, agricultural chemicals use and safety, etc. Combining this with the land degradation and desertification proposal listed above might be possible and advantageous. Incorporation of elements such as energy-efficient housing might open the possibility of GEF or other cofinancing.

e. Renewable energy: Renewable Energy for Improved Livelihoods

143. Despite early ADB assistance of emergency nature to the power sector, energy has not been a priority sector for ADB in Kazakhstan. In part this reflects the Government's confidence in own ability to restructure the sector and achieve increased energy efficiency (and consequent environmental gains) through partial deregulation of the power sector and private sector involvement. Availability of abundant non-renewable energy sources has traditionally acted as something of a disincentive to the consideration of renewable energy options in Kazakhstan. This picture may be slowly changing as poverty alleviation makes its way into Government priority setting. Decentralized renewable energy offers significant potential for improving the quality of life in the unconnected (and typically the poorest) rural areas. ADB's experience in Asia [most recently through RETA 5972 (PREGA)]³³ points to interesting opportunities in the renewable energy sector, especially the wind, small hydroplants and end-of-line photovoltaic

³³ The poor start made by the Bank in involving Kazakhstan in renewable energy cooperation was mentioned earlier on in Part III. That experience should be borne in mind when re-opening the dialogue on possible collaboration in the sector.

stations segments. High transmission losses in Kazakhstan (averaging about 14%) further strengthen the case. Underutilized opportunities exist for GEF cofinancing.

f. Municipal and Industrial Solid Waste Management

144. Urban environmental problems have been assigned a lower priority than rural concerns. Yet certain elements would deserve to remain in ADB's assistance pipeline. In the case of solid and hazardous waste management, although most problems originate in urban areas, its impacts are felt most acutely in peri-urban and even rural areas. Secondly, adequate management of waste is more than an environmental problem: it is an aspect of human development. The elementary or no management of solid waste, especially toxic industrial waste, is a major environmental and public health concern in Kazakhstan. *Oblast* and *rayon* environment agency staff have been dealing primarily with industrial pollution problems, and are not well prepared and positioned to tackle the multi-dimensional, cross-sectoral urban and peri-urban environmental issues. These issues tend to be addressed retrospectively and only when they are serious. Valuable experience and legislative and policy advances have been made under the Bank's TA 3350 and an investment project could build on these advances but a clearer commitment needs to be obtained from the Government to introduce management changes rather than rely only on new equipment and facilities. A possible support for the formulation of policy for dealing with accumulated wastes (see non-lending Priority 1 above) would further strengthen the overall policy framework.

C. Linkages with Government Programs and External Assistance

145. The level and type of ADB engagement in Kazakhstan need to be part of a coherent framework of overall assistance to Kazakhstan. This requires that proposed TA and loan activities conform to a strategy that is widely shared by others in Kazakhstan, and that implementation of programmed capacities is not threatened by absence of complementary measures supported by others. It also requires that there is common interpretation of the underlying causes of problems and desirable approaches to dealing with them. Finally, and somewhat obviously, any spatial and institutional overlaps must be kept to a minimum.

146. In Kazakhstan, in addition to national programs, several large transboundary environmental programs with substantial donor funding, in particular the Aral Sea Program and the Caspian Sea Program, occupy a prominent role and require close donor coordination. Other regional initiatives also call for close coordination and coherence between regional and national programs.

147. The activities proposed under the strategy favored in this document can be related to existing Government and donor activities to show the degree of agreement with them. Table 5 below summarized the main elements of coherence. Appendix C contains more details on the structure of donor assistance:

Table 5. Linkages of Proposed ADB Environment-Related Activities with Government and Donor-Funded Program

ADB Activities Proposed	Complementary Donor-Financed Programs	Complementary Government Programs and Initiatives
Technical Assistance		
Environmental Governance I: Environmental management at the local level	Some strengthening at local level as part of wider environmental programs such as Caspian Environmental Program (e.g., in Atyrau) or river-basin initiatives (e.g., the Irtysh). However, little attention to financing.	Decentralization is now an official policy of the government; New legislation establishes National Fund (taxes on non-renewable resources) Tax Code 2001 (taxes on renewable resources)
Environmental Dimensions of Rural and Water Sectors	World Bank 2002 Water Sector Strategy done in 2002 Other activities mostly regional: UNDP Aral Sea Basin Capacity Building for SD; WARMAP, WARMIS projects and their successors; UN SPECA activities; USAID early activities	New Water Code to be approved in mid-2003; WRC re-incorporated into MOA, possibly enhancing possibilities for sustainable rural development; National Drinking Water Action Plan prepared
Support to the Strategic Partnership for Implementation of UNCCD in the Central Asia Subregion (Regional)	World Bank/GEF Dryland rehabilitation; REAP priority area with 4 projects; Strategic Partnership Agreement for Central Asia supported by "Issues and Approaches to Combat desertification" strategic framework; GTZ CCD projects in CA including pilots in KAZ	National Action Plan to Combat Desertification first prepared in 1997; Updated and revised in 2002. Interdepartmental Commission to Combat Desertification (IDCCD) to be established
Participatory Water Management in Central Asia (Regional)	See above under Environmental Dimensions of Rural and Water Sectors. Aligned with SPECA Regional Strategy on Rational and Effective Use of Water and Energy resources in CA, demonstration zones on energy and water efficiency in Almaty and Bishkek;	Government plays an active role in all regional activities relating to water management
Environmental Governance II: Support for the National Commission for Sustainable Development	UNDP support from 1995, co-financed by USAID, EU/TACIS, especially Program on Institutional Strengthening for SD	NEAP 1998, Agency for Strategic Planning absorbed into MEBP, 1998-2000 Strategic Plan for Ecology and NR
Kazakhstan-China Partnership on Joint Management of Transboundary Waters (Regional)	ADB support for Regional Economic Cooperation includes Xinjiang Province; Transboundary Management of the Irtysh River Basin (France/ROK)	
Loans		
Second Water Resources Management Project and Land Improvement	World Bank Irrigation Improvement Project; Various activities under the Aral Sea Basin Program; WB-financed project in NE Kazakhstan and JICA proposal for a different part of North Kazakhstan; REAP 6 projects in support; UN SPECA new projects targeting Shu and Talas rivers	Positive impression of the first ADB Water Resource Management Project; new local initiatives such as Coordination Council on Sustainable Development of the Illi-Balkhash Basin, 2000; Illi-Balkhash Agenda 21 to start soon
Investment support for activities identified under the Strategic Partnership for Implementation of UNCCD in the Central Asia Subregion (Regional)	See under Support for Strategic Partnership for Implementation of UNCCD	See under Support for Strategic Partnership for Implementation of UNCCD

Second Rural Water and Sanitation Project	UNDP Aral Sea Program	Drinking Water Action Plan
Renewable energy: Renewable Energy for Improved Livelihoods	UNDP/GEF Project on Removing Barriers to Wind Power Production in Kazakhstan, UNDP support for int. environmental conventions REAP Project 6 CIDA Climate Change Support Fund	Energy Strategy. National Communication on Climate Change, IAC on Climate Change established, KAZNIIMOSK established
Municipal and industrial solid waste management	JICA Master Plan REAP proposal to establish CA Register of Waste and Pollutant Transfer and other four waste management project proposals	

148. While rightly concerned about poor integration across different levels of government and rightly emphasizing the need for complementarity of own program with other activities underway in Kazakhstan, ADB needs to probe also the synergies or lack of them within its *own* program. Several activities tentatively included in the CSP could be made to generate greater synergy. For CEA, the most important possibilities involve three of the proposed TAs, namely (1) Capacity Strengthening for Policy Coordination and Strategic Planning; (2) Capacity Building for Fiscal Management at the Local Level; and (3) the proposal of this CEA to making improved environmental financing at the local level a TA priority. This would suggest that merging of (2) and (3) might be possible and desirable. The other lower-order CEA priority for capacity building (Support for the National Commission for Sustainable Development) might justify its possible grafting onto proposal (1).

149. Good possibilities exist also for making *regional* environmental assistance more synergistic. This is so especially in the area of water management, by far the most complex environmental-and-economic issue in Central Asia, where up to 5 different divisions of ADB (Echo's CARECU, ECAE, RSAN but also ECID and RSES) are involved, barely managing to inform one another let alone work in concert. Greater internal coherence is necessary if ADB is to have the influence to shape large programs such as the Aral Sea Program. Special efforts, also related to water management, are needed to overcome the administrative separation within the ADB of Afghanistan from Central Asia. Afghanistan intends to make much greater use of the Amu Darya water for its projected irrigation needs. Not of immediate concerns to Kazakhstan, it nevertheless introduces a new element into regional initiatives.

D. Performance Monitoring

150. The strategy put forward in this CEA and the accompanying work program need to be monitored to judge the impact against the targets set. The approach to monitoring will reflect the experience with past and existing ADB-financed activities but should contain several additional elements. An environmental road map (not contained here) is the principal overall point of reference for future monitoring.

151. A single post-evaluation report of past loan projects in Kazakhstan has been completed to date simply because ADB's loan and TA program in Kazakhstan is very young. Furthermore, the loan post-evaluated [Loan 1406-KAZ (Agriculture Sector Program)] was not the most relevant from the environmental point of view. Interim monitoring speaks of implementation difficulties in the case of the Farm Restructuring loans and some difficulties also in the case of Water Resource Management and Land Improvement loans. The latter, nevertheless, appears highly rated by some in the Government.

152. Special Evaluation Study on Advisory and Operational Technical Assistance in Kazakhstan and the Kyrgyz Republic (SST: OTH 99036 of 2001) found that ADB's implementation performance in Kazakhstan was generally satisfactory. The study recommended the following: (i) TA design should carefully assess training needs, including proficiency in the English language; (ii) TA design should ensure active Government participation in developing recommendations to build a better sense of ownership and commitment; (iii) TA design should provide sufficient resources for interpretation and translation services; and (iv) training under TAs should encompass as many Kazakh Government officials as possible to mitigate the effects of staff attrition. These conclusions may be accurate but are somewhat superficial and avoid the substantive questions of AOTA's effectiveness (see paras. 121-122). Given the relatively poor record of the former MNREP in benefiting from capacity building support, future ADB technical assistance in this domain must be accompanied by performance indicators. Under the AOTA proposed, such indicators could be: (1) annual expenditures on environment-related activities by MEP and MOA; (2) administrative expenses per unit of environmental expenditure; and (3) staff turnover at central and local levels of MEP and MOA.

153. Monitoring of medium-term sector performance for ADB environment-related activities in Kazakhstan is expected in the following areas: (i) participation of local communities in natural resource management (based on field sample surveys); (ii) average irrigation efficiency in selected river basin segments (iii) water quality of selected major rivers and lakes such as the Illi, the Syr Darya and Lake Balkhash; and (iv) percentage of rural population with access to safe drinking water. Important methodological questions surrounding the choice of indicators to accompany CEAs have not been addressed by the Bank so far. Put briefly, there are two levels of indicators; The first group, common in ADB practice, measures the achievements of individual projects and programs (e.g. number of households connected to water, area actually reforested against the target set, etc.). The second, used in the early versions of CEA, propose to measure broader environmental parameters (e.g. river flow, ambient air quality etc.). What is being measured in the second case is not the quality of ADB's implementation or project design but ADB's judgment in associating its resources with those of the Government and other donors, i.e., the success in contributing to common objectives. In the case of Kazakhstan, some of the measured outcomes will reflect furthermore the effectiveness of regional policy formulation and collaboration.

E. Conclusions and Recommendations

154. After almost a decade of contraction, Kazakhstan's economy is beginning to grow again. The expansion of its petroleum sector and ability to attract private investment has substantially improved the country's fiscal situation. Progress is being made in several other areas. Despite these recent encouraging trends, development remains unbalanced and unsustainable. The bill for past environmental degradation has not been paid and is not being paid. The respite in the level of pressure on the environment during the past decade was due as much to economic contraction as to effective environmental regulation. It is essential that the effectiveness of environmental management in Kazakhstan improve ahead of the expected revival and further expansion of the economy to ensure that the unpaid environmental bill begins to diminish rather than grow bigger still. Unless this is done, the financial values of resource rents being generated and GDP indicators will overstate the sustainable level of incomes and welfare of the country's citizens.

155. Kazakhstan is not like any other country, not even like its Central Asia neighbors. Behind a number of similarities, there are important differences of population density, structure of the

economy and a spatial distribution of economic activities and environmental pressures. These and others make it important not to apply a common CA environmental mold in formulating an environmental strategy. Equally important is to resist a temptation to “look for” environmental problems just because certain problems exist elsewhere and institutions present in Kazakhstan have experience of dealing with such problems. The methodology of quantifying the economic cost of resource degradation in Kazakhstan needs to be revisited and results presented in a way that strengthens the hand of economic and budget decision makers rather than simply stating the values of future economic losses.

156. Environmental management in Kazakhstan has fallen victim to an expectations overload. Attempts to achieve greater mainstreaming of environment into the economic life of the country have added to complexity without offering a clear way forward. The process of mainstreaming needs to become more pragmatic. At this stage, piecemeal integration is needed, integrating through examples of practical outcomes. Integration, too, has to be driven by the demonstrated local need rather than be a top-down process. The mainstreaming needs to enter ADB’s own CSP in a more convincing way than hitherto. For instance, efforts to improve project programming or reform local finance should ensure that these activities include MEP and its local agencies rather than being conducted solely by the more usual seat of such activities (Ministry of Economy and Budget, in Kazakhstan’s case).

157. The Government, encouraged by the donor community and in good faith, has taken on international environmental commitments too easily and for the time being, it continues to be unable to meet them without further outside support. The process of strengthening local policy formulation and management capacity has not produced the hoped-for results in part because of the inability of the Government to retain trained staff and in part because of continued underfunding of environmental management.

158. The fundamental weakness of environmental management in Kazakhstan is an aspect of a deeper inherited problem, not easily overcome in the short run, namely the absence within the government of a sense of urgency and a drive to get things done efficiently. In environmental management, too, activities are not preceded by a clear statement of objectives and not accompanied by demands to demonstrate results let alone efficiency (or justify lack of it). Allocation of budgets is not related to performance. Data are collected but not used, lack of insights weakens the analysis and formulation of suitable responses. Largely absent is search for new ways of delivering the environmental management function (e.g., by subcontracting certain activities).

159. In making recommendations, CEA has to take into account the existing and anticipated composition and scale of ADB’s assistance to the country. ADB technical assistance and (especially) loan portfolio in Kazakhstan is relatively small and expected to remain relatively small in the short to medium run. If the analytical range of this CEA is wider than that of the existing country strategy and program it is in order to supply a broader context for the program as well as serve as something of a menu for possible program extensions or modifications. CEA also helps situate ADB’s assistance to the country within the overall structure of domestic and foreign-funded efforts that naturally are more wide-ranging than ADB’s own contribution.

The key recommendations of CEA concerning ADB’s involvement are the following:

160. To remain engaged in Kazakhstan’s environmental management despite improving economic situation of the country and a shift of international assistance —probably short-lived in the first-mentioned case— away from national-level in favor of regional level activities and away

from Kazakhstan towards the poorer reform-minded states of Central Asia. However, to accompany the continued engagement by greater selectiveness in technical assistance and stepped-up efforts to graft environmental considerations onto proposed loan projects.

161. Not to make environment-related assistance conditional on fundamental improvement of the capacity of the MEP that is unlikely to come about within the period of the CSP. Instead, identify activities that promise to deliver environmental benefits despite continued weakness of MEP. The most promising such activities are rural development and water management projects. They offer the greatest scope for simultaneously addressing environmental improvement and important components of improved livelihoods and their implementation exerts indirect pressure on the environment management agencies to improve their policies and procedures.

162. To accept the magnitude of the institutional build-up task and proceed pragmatically in providing assistance for this process. The assistance should target those components of institutional structure that are the most important for successful implementation of ADB activities or activities complementary to ADB activities. Two inter-related aspects are critical: improved allocation of funds for environmental activities (mainly through improved “re-cycling” of pollution charge revenues into environmental projects) and greater local capacity to formulate suitable environment-related interventions. This capacity needs to be enhanced in the first instance in the *oblasts* for which ADB activities are being programmed.

163. To link ADB’s investments in Kazakhstan’s environmental management to the priorities of NEAP despite the latter’s weaknesses. Where appropriate, seek modification of NEAP priority proposals to make them fit several objectives, including the priority strategic objectives under ADB-GOK PRPA.

164. To learn from the Framework Agreement on Land Desertification between ADB and GOC but re-calibrate it under the Strategic Partnership for Implementation of UNCCD in the Central Asia to reflect the important differences in the impact and economic consequences of land abandonment and desertification in the two countries. Within that framework, combine “win-win” projects requiring little or no concessional funding with components where grant or subsidized funding is appropriate and necessary. Rehabilitation of abandoned lands combined with biodiversity conservation or tree planting, land rehabilitation in combination with the introduction of decentralized renewable (solar, wind) power are examples of such packages.

165. To bear in mind that in Kazakhstan, rural focus by itself will not “take care of” the necessity to concentrate the population. ADB does not have a position on voluntary re-settlement in rural Kazakhstan, a vital component of any long-term strategy of infrastructure improvement in rural areas affecting also other, more directly environmental, programs such as land degradation and desertification. Re-settlement is hardly mentioned in the otherwise important output of RETA 5941. Re-settlement in rural Kazakhstan is unlike re-settlement linked to, say, construction of water reservoirs in densely populated countries. In Kazakhstan, it should be supported rather than avoided.

166. To widen the search of co-financing partners for environment-related components of loan projects (or new stand-alone projects) to the private sector, private foundations and others.

167. To include environmental education into the curricula and programs of selected schools and training institutions in future lending to the education sector (if any) in order to begin to strengthen the capacity of the environmental regulator at the local level.

168. In regional environmental initiatives with Kazakhstan's participation, to seize the regional (or subregional) political commitments to help advance domestic environmental agenda. At the same time, inject more realism into regional environmental cooperation that will continue to be driven by national economic priorities.

169. Domestically, the main road to improved synergy is through (1) greater ability to demonstrate the economic and financial benefits of environmental mainstreaming and dissemination of that insight (2) further support for entities such as river-basin organizations already having a cross-sector mandate (3) support for a cross-sectoral formulation of programs through the creation of *ad hoc* or permanent bodies to implement projects; (4) support for the Ministry of Economy and Budget in formulating budgets that can serve cross-sectoral programs and projects; (5) insistence on a greater and genuine say of project target beneficiaries – whose concerns are many and varied – project design and monitoring.

170. The synergy on the donors side requires, first, that project and program formulation does not stop at the stage of “who is doing what” but goes further to ask how things are being done and what the results have been. Internal evaluations are particularly valuable and ought to be better known.

171. Finally, Table 6 below summarized the proposed ADB environmental program for the period 2003-2006.

Table 6: Proposed ADB Environmental Program in Kazakhstan

ADB Proposed	Activities	2004	2005	2006
Technical Assistance				
	AOTA: Environmental Governance I: Environmental management at the local level (\$0.35mil)			
	AOTA: Environmental Governance II: Support for the National Commission for Sustainable Development (\$0.25mil)			RETA: Support to the Strategic Partnership for Implementation of UNCCD in the Central Asia Subregion (\$tbd)
			AOTA: Environmental Dimensions of Rural and Water Sectors (\$0.6mil)	
			RETA Participatory Water Management in Central Asia (\$tbd)	
Loans				
			Second Water Resources Management Project (\$50.0 mil)	
	Rural Water and Sanitation Project (from 2002)			Second Rural Water and Sanitation Project (\$tbd)
			RETA: Investment support for activities identified under the	Renewable energy: Renewable Energy for Improved Livelihoods

		Strategic Partnership for Implementation of UNCCD in the Central Asia Subregion)	(\$tbd)
			Municipal and industrial solid waste management (\$tbd)

Legend:

TA Priority I	
TA Priority II	
Loan priority I	
Loan Priority II	
Loan priority III	
Other supporting activities	

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- E. ?????????????????? ??????????????????
- F. ?????????????? ?????????????? ? ??????????????????

- II. ?????? ?????????? : ?????????????????? ?????????????????? ??????????????
- A. ?????????????????? ?? ?????????????? ??????????
- C. ?????????????????? ??????????????
- D. ?????????????????? ?? ?????????????????? ?????????????????? ??????????

 - 1) ?????????????? ??????
 - 2) ??????????????????????????
 - 3) ?????????????????????? ?????? ?????????????????????? ?????????????? ? ??????????

- E. ?????????????????? ?????????????????????? ??????????????????

- III. ?????????? ? ?????????????????? ??????
- A. ?????? ? ?????????????????????? ?????????? ?????????? ??????

 - 1) ?????????????????????? ?????????? ?????????? ??????

- B. ?????????????????????? ?????????????? ? ?????????? ?????????????? ??????
 - 1) ?????????????????????????????? ?????????????? (????)
 - 2) ?????????????????????????? ?????????????????? (???? ? ??????)
- C. ?????????????????????? ? ?????????? ?????????????????? ?????????????????? ? ?????????? ??????????????????
- D. ?????????????????? ??????????????????
- E. ?????????????????? ? ??????????????????

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- ????????????? A: ?????????????????????????? ?????????????? ?????????????????????? ?????????????????? ? ??????????????
- ????????????????? B: ??????????????: ?????????????????? ?????????? ?? ?????????????? ? ??????????
- ????????????????? C: ?????????????????? ?????????? ? ? ?????????? ??????????????
- ????????????????? D: ?????????????????? ?????????? ? ?????? ? ??????????????????

????????? ?????????? ???? ??????, ?????? ? 1990 ???? , ? ?????? ? ??????
44%, ??? ?????????? ?????????? ? ?? ?????????? ? 34 ?? 8 ??????????, ?? ?????, ?????
??. ???????? ???????? ?????????????? ? ????????? ????????? ? ?????, ?? ?????????
????? ????? ? ?????????????????? ?????? ??? ?????????? ? ?????? ?????????????
?????, ?????? ???????? ?????????????? ?? ?????? ?????????????????? ??????????. ?????????????????
????????????????????????????? ?????? ? ?????? ?????????? ?????????/?????????, – ????????? ???????
???? ?????????? ?????????? ?????????????????????? ?? – ?? ?????????? ?????????? ?????????
????? ?????????? ? ?????? ???? ?????????? ?????????????? ?????, ?????? ??????????????????. ??????????
????????? ???????????????? ? ?????????? ?????????? ?????? ?????????? ?????????????????
?????????????????, ?? ?? ????? ? ?????????????? ?????????????? ?????????????????. ? ??????
? ?????? ?????????????? ?????????????? ?????? ?????????????? ? ?????????????
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????????????? ? ?????????? ??????????. ? ?????? ?????? ?????? ?????????????? ??????, ????
????????????????? ?????????????? ?????? ?? ??????????????, ?????? ?? ?????????????? ?????????????????
????????, ?????? ?????????????? ??????????????, ?? ?????????????? ?????????? ?????? ?????????????
? ?????????????????? ?????????????? ?????????????????? ?????? ?????????, ?? ???????? ??????
????????????? ?????????????? ?????????????? ?? ?????? ??????. ? ?????? ?????????? ?????? ?????????????
????? ?????? ?????? ?????????????? ?????????????? ?????? ?????????????????????? ?????? ?????????????????
????????????????? ? ?????? ?? ?????????? ?????????????????????? ??????, ?? ? ?? ??????????
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????????????? ?????????????? ?????? ?????????????? ?????? ?? ?????????? ? ?????????????????? ?????????
? ?????? 1980-? ? ?????? ?????????? ?????????????? ?? ? 1990-? ?????????? ?? ?????????????????
????????? ? ??????????????. ?????????? ?????????????????????? ?????? ?????? ?????? ?????????? ? ?????????,
????????????? ? ?????????? ?????????, ?? ?????????????? ??? ?????????????????? ?????????????? ?
????????????????? ?????????????? ?????????????? ?????, ?????? ?? ?????????????????? ?????????????? ?????????
(????????? ?????????????????? ?? ?????????? ?????????????? ??) ?? ?????????????????? ?????????????????????
(????????? ?????????????????? ?????????? ?? ?????????? ??)³⁶, ?? ?????????????????????? ? ?????? ?????????? ?
????????????????????? ??????. ?????????????? ?????????????? ?????????? ?????????? ? ?????????
?????????????????????, ?????????? ?????????????? ? ?????? ?????????????? ?????? ? ?????? ??????????????
????????????????????????? ??????????. ?? ?? ?????? ??????????, ?????????????????? ?????? ?? ?
????????????? ?????????????? ?????????????????? ?????????????? ??????????????. ?????????????????
????????????????????? ?? ?????? ?????????????? ?????? ?????????????????? ? ?????????????????????? ??????????????.
?????? ?????? ?????????????????????? ?????? ? ??????????????, ?????????????????? ?? ??????????????????
?????? ?????, ??????????, ? ?????????????? ?????????????? ?????????? ?????????? ?????????????????????
????????????????? ??????????????. ? ?????? ? ?????????????? ?????????? ?????????? ?????????? ??
????????????? ?????????????? ?????? ?????????????? ?????, ?? ?? ?????????????????????? ??????????
????????????????? ?? ?????????????? ?? ?????????????????? ? ?????????????????????????? ??????, ?????
????????????? ?????? ?????????????????????????? ??????, ?????????? ?? ?????????? ??????. ?????????? ??
????????????????? ?????? ?? ?????????????? ?????? ??, ?????????????? ?????????? ?? ??????
????????????????????? ?????? ?????????????????? ?????????????????????? ? ??????, ?? ?????? ?????????? ? ?? ?????
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????? ??????, ?? ?????????? ?????????????? ?????? ?????????? ?????????????????? ? ?????????????????????
????? ? ?????? ?????????? ?????????? ?? ?????????? ?????????????? ?????????? ?????????? ?
?????????????. ? ?????? ?? ?????????????? ??, ?? ?????????? ?????????? ? ?????? ?? ??????
????????????? ?????? ?????????????? ?????????????????? ?????????? ?? ?????? (?? ??????????)

³⁶ ?????????? ?? ?????????????? ?????? ?????????????? ? ?????????????, ?????????? ?????? ?????? ?????????????? ??
????????????? ??????. ????????????? E ?????????? ?????????????? ?????????????? ?????????????.

????? ?????? ??????? ? ????????????????? ??????, ??? ??????? ?????????? ???????????
????? ?? ?????????? ??????????). ?????????? ?????????????????????????? ?????????? ???????
????????????? ?????????? ?????? ?? ?????????? ?????????? ?? ?????????????, ??? ?? ?? ??????????
?? ?????????? ?????????? ??????????, ?? ?? ?? ?????????? ??????????. ?????? ?????, ?? ??????????
????????? ?????, ??? ?????????? ?????????? ?????????? ?????????????? ?????????????? ?????????? ?
?????????. ??????? ?? ?????????????????? ? ?????????? ?????????? ?????? ?????? ??????
????????? ??-?? ??????? ?????????????? ?????????? ? ?????????? ?? ?????????? ?? ??-?? ???????
????????????????????? ?????????????????? ??????? ?????????? ? ?????????? ?? ?????????????????????????????? ??????
????????????????? ?????? ?????????????????????? ?????????? ?? ?????????????? ?????? ?? ?????? ??
????????? ? ?????????????????????? ?????????????? ?????????????? ??????.³⁷ ??? ?????????? ??????????
????????????? ?????????????? ?????? ?????????????????? ?????????????????? ?????? ?????????? ???????
????????? ?????????????????? ???????, ?????????? ??????? ?????????? ??????, ?????????? ??????
????????????????????????? ?????????, ?? ? ?? ?? ?????? ?????? ?????????? ?????????? ??????????????
????????????, ??????? ?????????? ?????????? ?? ?????????????????? ?????? ?? ?????? ?? ??????????????
????????? ?????????????? ??????. ??????? ?????????? ?????????????????? ?????? ?? ?????????????
????????????????????? ?????? ?????? ?? ?????? ?????????? ?????????????????? ??????????????. ??????????
????????? ?????? ?????????????????, ?????? ??-????? ?????????????? ?? ?????????? ??????????????????
?????? ? ?????????? ?????????????????????????? ?????????.³⁸

B. ?????????? ?????????? ?????????????? ??????

??? ?????? ?????????? ?????????????????? ?????? ?????????? ? ?????????? ?????????????? ? ?????????? ?
????????????? ?????????? ??????????. ??? (1997), ?????????? (1991), Puri (2003), ??????????
?????? ?? ?????????? ?????????????? ?????? (?????, ??????) ?????????????????? ??????????????
?????????????. ? ?????????????? ?????????? ?????????????????? ??????????????, ?????? ???
Environmental Statistics (2001) ??? ?????????????? ??????? ??????????????. ?????? ?????? | ?????
????????? ?????????? ? ?????????????????? ??? ?? ?????????? ?????????? ??????? ??????????????
?????. ?????????????? E ?????????? ?????????????????? ?????????.

1. ??????? ??????????:

?-?? ?????????????????????? ?????????????????? ? ?????????????????? ?????????, ??????? ?????????? ? ??
????????????????????? ?????????? ??????? ?????? ? ?????????????? ??????????????. ?????????? ? ??????????????
????? ?????????? ??????? ?????? ? ??????? ?????????????????????? ?????????? ??????????????. ?????????? ??
??, ??? ?????????????? ?????????????????? ?????? ? ?????? ?????????????????? ??????, ?????????????, ??? ?
????????????? ? ??????????, ?????????? ?????????? ?????-????????????? ?????????? ?????? ?????? .
? ?????? ?????????? ?????????????????? ?????? ? ?????????????? ?????????????? ?? ?????????????? ???????
????????????? ?????????????????, ?????????????????? ? ?????????????? ?????????????? ??????????. ? ??????????
?????, ?????? ?????????????????????????? ?????????? ?????????????????????????? ?????????, ?????????? ??????????????
????????????????? ?????? ? ??????????????????????, ?????????????????? ?????????????? ?? ?????????? ???????

³⁷ ?????????? ?????? ?????????????????? ?????????? ?????????? ?????? ???????.

³⁸ ? 2001 ??? In 2001, ?????????????? ?????????????? ?????????? ?????????????? ?????? ?????????????????????? ?????????
????????? ? 5 ?????? ?????????? ??? ?????? ?????? ?????? ?????? ?????????????? ?? ?????? ? ??????????, ?????????
????????? ?????????? ? ?????????????? ??????????. ?????????? ??????? ?????? ?????????????????? ?????? ?????????? ?????????? ?
????????? ?????? ?????????????? ?????????, ??????? ?????? ? ?????????????? ?? ?????????? ?? ?????????????? ???????
?????????. ?????? ?????????????????? ??? ?????? ?????????????? ?????????? ? ?????????????? ?????????????? ?????????? ?
????????????? ?????????????? ?????????????? ??????????, ?? ?????? ?????? ?????? ?????????????? ??????????????????
????????????? ?? 8% ??? (21 ????? ? ?????????? ?????). ?????? ??????? ?? ??????? ?????????? ?????????????????? ??????
????????????????? ??????? ?? ?????????? ?????????? ?????? ?????????? ??????. ?????????????????? ?????? ??????? ?????? ??????
????????????????? ??????? ?????????????????? ?????????????? ?????????, ? ?? ??????? ?????????????????? ?? ??????? ?????????.

2. ?????? ????????: ??????? ?????????????? ????

???????? ?????????????????? ????????, ?????????? ?????????????????? ??????? ?????????? ??? ????????,
????????????????? ?????? ??? ??? ?????? ? ??? ??????, ? ??? ?? ?????? ???, ???
?????????????????????????????, ??????? ? 1860, ? ?? ?????????? ?????? ??????? ? ??????????????????
????????????? ?????? ?????????? ? ?????????? ?????⁴², ??????? ?????????? ?? ?????????????????????
????? ?????????? ?????????? ??? ?? ???. ??????? ?????????????? ?????, ?????????????????
????????????????? ? ?????????????????, ?????????? ?? 15 ??????, ? ??????? ?????????????????? ?????? ??
????????????? ? ?????????? ? 1950 ?????. ?????????? ?????????? ??????????, ?????????????? ??????????
?????, ?????????????? ?????????????? ? ??????????, ?????????????? ?????????? ?????????? ?
????????????? ?????? ?????, ? ?? ?????????????? ??????? ?????? ?????????????? ??????????????,
????????????? ?? ?????? 5 ?????????????? ??????, ?????????? ? ?????????? ?????????????? ?????.
????????????????? ??? ?????????????????? ?????? ?????????????? ?????????? ?????????? ??????????
????????? ?????????? ?????????????????????? ?????????? ?????????? ? ??????????
????????????? ?????????????????????? ?????????? ?? ?????????? ?????.

????????? ?????????? ?????????????????? ?????????? ?????????????????? ?????????????????, ??????????
?????, ?????????????? ??????, ???, ?? ? ?????? ?????????, ?????????????????????? ??????????????
?????????????. ?????????? ?????????? ?????????????? ??? ?????? ?????? ? 1994 ??? ? ??????
????????????? ?????????? ?????????? ? ?????????? ?? ?????????? ?????????????????? ???????
????????????????????? ?????????????????????? ?????????? ?? ?????????? ?????. ??????????????????
????????????? ?????????? ?????? ?????????? ? 1997/1998 ? ??? ? ?????????? ? (i) ?????? ???????
????????????? ? «?????????»“ ????????, ??????? ?????????????????? ?? ?????????????? ??????????????
????????????? ?????????????????????? ? ?????????????????? ?????????? ??????? ?????????? ??
????????????? ?????????? ?????????????? ? ?????????? ?????????????? ?????? ? ?????????? ??????????????
????????? ?????? ?? ?????????????? ?????? ? ????????? 15 ?????????????; ? (ii) ?????????? ??????????
??? ?????????????? ?????????????????????? ?????????? ?? ?????????????? ??????. ??? ?? ?????? ?????? ??
????????????????????????????? ??? ?????????? ??????????, ?????????? ?????????? ? ?????????????? ?
????????????????? ?????????????? ?????????? ?????????? ?????? ?????????????? ??????????????????
????????????????? ?????????????????????? ? ?????????? ?????????? ?????????????????? ?? ?????????? ??????????????????
?????????????????

3. ?????? ????????: ?????????????? ?????????????????? ????

?? ?????????????? ? ?????????????? ?????? ?????????? ?????????????????? ?????? ?????????????????????, ??????? ???
?? ?????????????? ??????????. ?????????? ?????????? ?????????????? ? ?????????? ?????????????????? ?????????????, ?
?? ?????????????????????????, ??? ? ??????? ? ????????. ??? ?? ??????, ??????? ?????? ????? ?
????????????????? ?????? ?????? ? ??????? ?????????????????? ?????????????????? ? ?????????????????? ??????
?????????????, ? ?????????? ?????????? ? ??????? ??????. ?????????????? ?????? ??????????
????????????????? ?????????????? ?????? ?????????????? ??????, ?????????? ?????????? ??????????
????????????????? ?????????, ??? ?????? ?????????? ??? ?????????????? ?????????????? ??????? ?????? ?
????????????????? ?????????????? ?? ??????????????

4. ?????????? ?????????? ? ??????????????????

????????? ?????????????? ?????? ?????????, ?????????? ? 1991 ?????. ?????????????????????????????????? ???????
????? ??????? ?? ?????????????????????????? ?????????????????? ? ??????? ?????? ??????? ??????????????????
?????????????. ?????????????????? ?????????????????? ? ?????? ?????????? ?????????????????? ?????????? ? ??????

⁴² ? 1960 ??? ???? ???? ???? ???? ???? ???? ???? 60 ?³ ? ???. ??? ???? ???? ???? ???? ? 5 10 ?³ ?
??? ? ?????????? ??????. ??????? ?????????? ??????? ?????????????? ? ?????????? ?????? ?????????? ? 1950 ??? ? ?
????????? ?????? ?????????? ??????.

???????????? ?????????????? ? ?????????????? ?????????????? ? ?????????????? ??????.
????????????? ?????????? ??????, ?????? ?????? ?? ?????????? ?????? ? ?????????? ?????????????????
????????????? ? ?????????????? ?????? ?????? ?????????????????? ?????????? ? ?????????????? ??????????,
????????? ?????????? ?????????? ?????????? ?????????? ?????????? ?????????? ?????????? ?????????? (?????????
????????????????????? ??????????, ?????????????? ??????????) ? ?????? ?????? (????????? ?????????? ?
????????????????? ?????????? ?? ?????????????? ??????????????????) ?????????? ?????????? ?????????
????????????????????? ?????????????????? ?? ?????????? ? ?? ??????. ?????? 10% ?????????? ?????????? ?? ???
? ??-????????? ?????????? ?????????? ??????????????, ?????????? ?????????????? ?? ?????????? ?????????????? ?-
?? ?????????????????????? ?????????????? ? ?????????????????? ?????????????? ?????????.

?? ?????????????? ?????????? ?????????????? ?????????? ? ?????????? ?? ?????????? ?????????????????????
????????????????? ?? ?????? ?????????? ?????? ?????????????????? ??????????????????. ?????????????????????? ?????????????
????????????? ?????????????? ?????????????? ? ?????????????????? ? ?????? ?????????? ?????????????? ??????????????
?????. ?????? ?????????????????? ?????????????????????? ?????????? ?? ??????????, ?????????????? ?????????????? ?
????????????????????? ?????????? ?????????????????? ?????????? ?????????????? ? ?????????????????????????????????
????????????????????? ?????? ?????????????????? ?????? (????????????????? ? ?????????????????????? ??????????????????, ??????
????? ??????????, ?? ?????????? ? ?????????? ?? ???),??? ? ? ?????????????????? ? ?? ?????????????????? ??????????
????????????????? ?????????????????????? ?????? ?????????? ??-?? ?????????? ??????, ?????????????????? ??????????
????????????????????? ? ??????????????, ?????????????????? ?? ?????????????????????? ?????????????????? ?????????? ??????????????
????? ??? ?????? 1991 (????????????????? ?????????? ??????????) ?? ?????????? ?????? ?????????????????
????????????? ?? ?????????????? ??????????. ?????????????? ?????????? ?? ?????????????????????? ?????????? ?
????????????? ?????????????? ?????????? ? ?????????????? ?? ? ?????????-????????????????? ??????. ?????????????????????
????????????????????? ?????????????? ?????? ?????????????????? ? ?????????????? ?????????? ?????????? ? ?????,
????????????????? ? ?????????????? ?????????????????? ??? ? ?????? ?????????????????? ?????????????????? ?????????????
?????????????????. ?????????? ?? ?????????????? ?? ??????????????, ?? ???? ?????????????????? ?????????? ?? ??? ???
?? ?????? ??? ?????????????? ? ?????????????????????? ?????????????????????? ?????????????????? ?????? ?????????????? ?
????? ?????????????????????????? ?????????? ?????????????????.

????????????????????? ?????? ?????????????? ?? ?????????? ?????????????????? ?????? (?? ??????) ?????? ?????????
????????? ?????????????? ?????????? ?? ?????????????????????? ? ?????????????????? ?????????????? ?????????????? ?? 1997
???? ? ?????????? ?? \$ 4.6 ?? \$ 6.2 ?????????????????⁴³. ?????????????? ?????????????????? ?????????????? ?????????????
????????? ?????????????????? ?????????? ? ?????????????? ??-?? ?????????????????? ?????????? ? ??????????????. ?????????
2002 ?????? ?????????????????????? ?????????? ?? ?????????? ? ?????????????????????????? ?????????????? ?? ???? ?????????????
????? ?????????????????????? ?????????????????? ??????????????. ?????????? ?????? ?????????????????? ? ?????????????????? ??????
????????? ? ?????????????? ?????????????????????? ?????????????????????? ?????????????? ?????? ?????????????? ?????????????
????????????????????? ?????????????????? ?????????????????????? ?????????????????????? ?????????????????????? ?????????????
????????????????????? ?????????????????? ?????????????????? ?????????????????????? ?????????????????????? ?????????????
????????????????????? ?????????????????? ?????????????????? ?????????????????????? ?????????????????????? ?????????????
????????????????????? ?????????????????? ?????????????????? ?????????????????????? ?????????????????????? ?????????????
?? ?????????????? ?????????????????? ?????????? ?????????????? ?????????????????????? ? ?????????????????????? ?????????????.

5. ?????????????? ?????????????? ?????????????? ? ?????????????????? ?????????????????? ??????

«????????????????? ?????????????????? ?????? ?????????????? ?????????????? ? ?????? ?? ?????????? ?.
????????????? ?????????????? ?????????????????? ?? 45 ?? 87 ?????????????? ? ?????????????????????
????????????????????????????? ??????. ?????????????? ?????????????? ?????????????? ??????????????????
?????, ?????????? ? ?????????????????????? ??????????» [????????? (2003)]

⁴³ ? 2001 ?????? ??? ?????????????????? ?????????????? 21 ?????????????? ?????????????? ??? (??? 110 ?????????????????? ?????????????? ??? ??
?? ? or \$110 billion at ???).

?? ????????? 4 ?????????? ?????????, ????????? ?? ????????? ??????????? ????????????? 2001 ????? (????? 28% ?????? ??????????), ?????? 3 ?????????? ?????? ? ?????????? ??????????, ?????????? ?????????? ?????????? ??????????????— ??? ?? ?????????????? ??????????????????— ?????????????? ??????. ??? ?????????????????? ?????? ?????? ?????????????? ? ?????????????????? ?????????????? ?????? ? ?????????? ?????????? ??????????????, ??? ?????????????????? ? ?????????????? ?????????????????????????????????????? ?????????? ?????????????? ?????? ?????? ?????? ?????????? ?????????????????? ?????????? ?????????? ?????? ? ?????????????????? ?????????, ?????????, ??????—????? (?? ?????? 3) ?? ?????????????????? ?????????? ?????? ?????????? ? ?????????? ? ??????, ?????????? ? ?????????? ?????????? ?????? ?????????? ??????????????. ? ?????????? ?????????? ?????????? ?????????????????? ?????????? ?? ?????????? ?????????????? ?????????? (?????, ?????). ?????????????????????? ?????? ?????? ?????????? ? ??????????, ? ?????????????? ??????????, ?????????????????? ?????????? ??????????, ?????????? ?????????????? ?????????? ?????????????????? ??????????????. ?????????? ?????????? ?????????????? ?????? ?????????? ? ?????? ?????????? ?????????? ?????????? ?? ?????????? ?????????????????????????? ? ?????????? ??????????, ?? ??-????????? ?????????? ??????????????????. ?????????? ?????????? ?????????, ??? ?? ?????????? ?????? ?????????????? ?????? ?? ?????????????????? ?????????????????? ?????????????????? ?? ?????????? ?????? ??????????????, ??? ??? ?????????? ?????????????? ? ?????????????????? ?????????????????? ?????????? ? ?????????? ?????? ?????????? ?????? ?????????????????????????????????????? ?????????.

6. ?????????????????????? ? ?????? ? ?????????? ?????????????????? ??????????????????

?? ?????????? ?????, ?????????????????????? ?????????????? ?????? ?????????????????????????????? ?????????? ?????????? ?????????? ?????????????????? ?????????????? (?????, ?????? ? ?????????? ??????). ??????, ??????????????, ?? ?????????????????? ? ?????????????????????????????????? ?????????? ?? ?????? ?? ?? ?????????????? ??????????. ? ?????????? 1990-? ?? ?????????????? ?????????????????? ?????????????????? ?????????????????? ?????????????? ?????????????? ?????????????????? ?? 60 ?????????? ?????? ?????? 1990-?. ?????????????? ?????? ?????????? ?? ?????????? ?????????? ?????????????????????? ?????????, ?????????????????? ?????? ?? ?????????? ?????????????????? ?????????, ??? ?????? ??????????????????????. ?????????????? ?????????????????????? ?????????????????? ? ?????? ??????????. ?????????????? ?????? ?????????????? 40-50 ?????????? ?????? ??????????????????. ? ?????????????? 71 ?????????????????????, ?????????? ?????? ?????????????????????????????????, ?????????? ?????????????????? ? ?????? 17.3 ????. ? ?????????? ??? ?????????????????? ?????????????????????? ?????????????????? ?????? ??, ?????????? 70% ?? ?????????? ?????????????? ?????? ?????????????????? ?????????? ?????????? (?? ?? ?????????????????????? ?????????? ?????????? ??????, ?????????????????? ?? ??????????????), 15% ?????????????? ?? ? ?????????????? 15% ??????????????????. ?????????????? ?????????????????? ?????????????????? ?????? ??????????, ?????????????????? ? ?? ?????? ?????????????????? ?????? ?? ?????????????? ?????????? ??????????. ?????????????? ?????????????? ?????? ?????? ?? ?????????????? ?????????? ??? — ?????? ? ?????????????? ?????????? — ?? ?????? ?????? ?? ?????????????????? ?????? ?????????? ? ?????????????????????? ?????????????? ??????????.⁴⁴

????????????? ?????????????? ?????????????? ?????? ? ?????????????????????, ?? ?????? ?????????? ?????????????? ??????. ?????????????? ?????????????????????? ?????????????? ?????????? ?? ??????. ?????????????????? ?????????????? ?????? ?????????? ?????????????????????????????????????? ?????????? ?? 10 ????. ?????????????? ?????? 400 ?????? ?????????????????? ?????, ?????????????? ?????? ?????????? ?????? ?????????? ? ?????????????????? ?????? 1.4 ??? ? ?????? 6 ??? ?????????????????????? ??????????????????. ??? ?????????????????? ??????????????, ??? ??? 5,000 ?????????? ?? ?????? ?????????????? ? ?????? 1997, ?

⁴⁴????? ?????????????????? ?????????? ?? ?????????? ?????????????? ?? ? ?????????????? ?????? ?? ??????, ?????????? ? 1990, ?? ?????? ?????????????????????? ?????????????? ?? ?????????????? ?? 2002 ?????????????? ?????????? ?????? ?????? ?? ?????????????????? ?????????? ?? ?????????? ?????????????? ?? ? ?????? ?????? ??????????????. ?? ?????? ?????????????? ?????????????????? ?????????????????? ?????????? ? ?????????????? ?????????????? ?????? ?? ?????? ?? ?????????????? ? ??????, ?? ?????????? ?????????? ??? ? ??????.

????????????? ??????? ????????? ???? ?????????? ?????????????? ??????. ?????????? ???? ???? ????????? ????????? ?????????? ? ?????????? ? ????? ?????????, ? ????????? ????????? ????????? ? ?????????????? ???? , ?????????????????, ????????????? ?????????, ?????????? ? ?????????????? ?????? ? ????????? ???? , ?????????????? ?????????????? ? ????????? ?????????, ????????????? ?????? ?????? ? ?????????????, ?????????????? ??? ????????? ? ????? ?????? ?????? ? ?????????? ?????????????? ?????????? ?????????? ?????? ?????????????, ????????????? ????????????? ?????? ?????? ? ?????????????? ?????????? ? ? . ????????? ????????? ?????? ? ?????????????? ?????????????????? ?????????? ? ? ?????????????????? ?????????????????? ?????????????????? ?????????? ???? ???? ?????????? (?? ?????) ??, ??? ?? ?????, ?? ??????????????.

????? ?????????? ? ?????? ???? ?????????????? ??? ?????????? ?? ?????????????????? ?????????????? ? ?????????????? ?????????????? ?????????????? ??????, ????????? ?????????????????????? ?????? ?? ?????????????????? ?????????? ??????????, «????????????? «????? ?? ????? 2002-2010»», ?????????????????? ????? ?????? ??? ?? ??? ?????? ?????, ?? ??? ????? ?????????????????????, ?????? ?????????? ?? ?????????? ?? ?????????????????????, ?????????????????? ?????????????? ?? ?????????????? ?????????????????????, ?????????????????? ?????? ?????????? ?? ?????????? ?????????????? ?????? ? ?????????????? ?????????????? ?????????????? ? ?? ??? ?????????????????? ??????. ?????????? ?????????????? ?????????????? ?????? ?????????????? ?????? ?????????????? ?????????????????? ?????? 1999: ?? ?????????????? ?????????? (i) ?????????? ?????????? ?????????????????? ?????? ? ?????????????????? ?????????? ?? ??????????, (ii) ?????????????? ?????????????????? ?????????????????? ?????????? (??15-20% ? ?????????? ?????????????? 10 ???), ? (iii) ?????????? ?????????????????? ??????????????????. ?????? ?????????????? ?????? ?????????????? ?????? ?????????????? ?????????????? ?????? ?????? ?????????????? ?????????????? ??????, ?????????? ?????????????? ?????????????? ??????, ?????????? ?????????????????????? ?????????????? ?????????? (?????, ?????????????? ?????????, ?????????? ???)— ? ?????? ?????? ?????? ?????????? ?????????? ??????????. ?????????????? ?????????????????? ?????????????????? ?? ?????????? ?????????? ?????????????, ? ?? ?????????????? ??????????.

????????????????? ?????? ?? ?????? ? ?????????????????????? (?????) ?????? ?????? ?????????????????? ??????????????????????. ?????????????? ?????? (1997) ?????? ?????????????? ? ??? ?????????????????????? ?????????, ?? ?????????????? ?????????????????????? ? ?????????????????? ?????????????, ?????? ? ?????????????????? ?????????????????? ?????????????????? ?????????????????? ?????????? ??????????????. ?????????? ?????????? ?????????? ?????? ?????????? ? 2002. ?????????? ?????????????????????? ?? ?????????????????? ?????????????? ? ?????? ?????????????????????? ? ?????????????????? ??????????-21, ?????????? ?????????????? ?????????? ?????? ?? ?????? ?????????????????? ? ?????????????????????? ??????????????, ? ??? ?? ?????????? ?????????????????? ?? ?????????????????????????????? ?????????????????????? — ?????????? ?????????????????????????????? ?????????? ?? ?????? ? ?????????????????????? (????), ?????????????? ?????????????????????????? ?????????? ?? ??? ?????????????????? ???, ?????? ?? ?????? ? ?????????????????????? ?????? ?????????????? ?????????????????????? ? ?????????????????????????????? ?????????????????????????? ??????????, ? ??? ?? ?????????????? ?????????? ?? ?????? ? ?????????????????????? ?????????????????????? (??).

? ?????????????? ?????? ?????????? (?????? ?????????????????, ?????????????????? ?????????????? ?????? ? ? . ?.), ??????, ?????????????? ? ?????????????????? ?????????????????? ?????? ?? ??????????????????????, ?????? ?????????????? ?? ?????? ??????????????. ? ?????? ? ?????? ?????????????????? ?????????????? ?????????? ?????????????????? ?????????????? ?? ?????????????? ?????? ??? n? ?????????? ?????????????????? ? ?????????????? ?????? ?? ?????? ?????????? ??????????????????, ??? ?? ?????? ?????????????? ? ?????????????? ? ?????????????, ?????? ? ?????????????? ?? ?????????????????????? ?????????? ??????????????????.

2. ?????????????????????????? ??????????

????????? ?????? ?????????????????????? ? ?????????????????? ?????? ?????????????? ?????????? ?????????????????????? ?????? ?????????????? ??????????. ?????????????????? ?????????? ?????????????????????? ??????

????? ? ??? (1993), ????? ?? ?????????????? ?????????? (1997), ????? ?? ? ?????
 ?????????? ????? (1997), ????? ? ?????????????? ?????????????, ?????????????? ?? ?????????
 ?????????????? (1997) ? ????? ? ?????????????? ????????? (1998). ????? ?????????? ??????,
 ?????????? ? 2001 ?????????? ?????????????????? ?? ?????? ?? ?????????????????? ??????????
 ??????????. ? 2002, ?????? ?????? ? ?????????????? ?????????? ?????????????????? ?????????
 ?????????????????????? ?????????? ??????. ?????????, ?? ?????? ?????????????????????? ??-?????????
 ? ???, ?????????????? ??????????. ? ?????? ????????? ?????? (????? ? ???), ?????
 ?????????????????????? ?????? ?????????? ? ?????????????? ??????????????. (????????? ?????? ??????
 ????????? ? ??? ? ?????? ?? ?????? ?????????????? ??????, ??????? ?????????????????????? ?
 ?????????? ?????). ?????? ?? ?????????????? ?????? ????????? 200 ?????????????????????? ?
 ?????????????????? ?????? ?????????????????? ?? ?????? ?????????????? ?????? ? ?????????????? ?
 ?????? ?? ?????????????? ??????????. ?????????? ?????????????? ?????????, ?? ?? ?? ??????
 ?????? ?????????????????????? ?????????????????? ?? ??????. ?????????? ?? ?????????? ??????????
 ?????????????? ?????????????, ?????????? ?????????????????????????????? ? ??????????????????, ? ?? ?
 ?????????? ??????????. ?????????????????? ? ?????????????????? ?????????? ? ?????????????? ??????????
 ??????? ?????????? ? ?????????????? ?????????????????? ?????????????? ??????????????. ?????????? ?????????? ?
 ?????????? ?? ?????????????????????? ?????????????????????????????? ?????????????????????? ?????????????.

????????????????????????? ?????? ? ?????????? ?????????????? ?????? ?? ??????????????
 ?????????????????? ?? ?????? ?????????????? ?????? (? ????????? 2002, ??????????????????
 ?????????????? ?????????? ? ?????????? ?????????????? ??????) ? ?? 106 ?????????????????? ?????????? ?????
 (? ?????????????? A). ? ?????????????????? ? 2002 ? ?????????????? ?? ?????????? ? ??????,
 ?????????????????? ?????????? ?? ?????????????????? ??????????????????, ?????? ??????????????????
 ?????????? ?????? ?????? (????? ?? ?????????? ? ?????????????????? ??????????????????
 ?????????5?? ?????????? (??)), ? ??? ?????????????????????????? ?????? ?????? ? ??????
 ?????? ? ?????????????? ?????????? ?????? ? ?? ? ?????????????????? ?????????????? ?
 ?????????????????? ??????????. ?????????????????? ?????? ?????? ?????????????? ?? ? ?????????????, ??
 ?? ??????, ?? ?????? ?????????????? ?????? ?????? ?? ?????????????????? ??????????????
 ?????????? ? ?????????????? ?????????????????? ? ?????????????? ?????????????????????? ? ?????? ??????
 ?????????????.

????????? ?????????????? ?????????????? ?????????????? ?? ?????? ?????????????? ?????? ?????????? ??
 ?????????? ?????????????? ? ?????????????? ??????, ? ?????????? ?????????? ?????? 1500 ?????????????? (?
 ????????? 80 ?????????? ?? ?????????????? ?????? ?? ?????? ?????????????? ??????????), ?????????????
 ?????????????? ? ?????????????? MEP, ?? ? ?????????????????????????? ? ?????????????? ?????? ?????????? ??
 ??????????. ?????????????????????????? ?????? ?????????????????? ?? ?????????? ? ?????????? ? ??????????
 ?????????? ?????????????? ?????????????????????? — ?????? ?????????? ?????????????? ?????????
 ?????????????????????????? ?????????????? — ? ?????? ??????????. ?????????????? ?????????????????? ?????????? ?
 ?????????? ? ?????????? ?????????? ?? ?????????????????? ?????? ?????????????????? ?????????? ??????
 ?????????? ?????????????????? ?? ?????????? ?????????????.

?? ?????????????????? ?????????? ?? ?????????????????? ?? ?? ?????????????????? ??????????????????,
 ??????????????. ?????? ?? ? ?????????? ?????????????? (????????????????????? ?????????? ??????????
 ?????????????? ??????????) ?????????????? ?????????? ??????????

?? ?????????????? ?????? ?? ???? ?????????? ?????? ?????????????????????????? ?????????, ??????
 ?????????? ? (i) ?????????????????????? ?????????????????????? ?????????????????? ? ?????????????? ??????????????????
 ?????? (ii) ?????????????????? ?????????????????????? ??????????????????????. ?????????????? ?????????? ? ?????
 ?????????????????????????? ?????????????? ?? ?????????????????? ?????????????? ??????????????. ?????????? ??????????
 ? ?????? ?????????????? ?????????????????????????????? ?????????? (??????, ????) ? ??????????
 ?????????????????????? ?????????????????????? ? ?????????????????????? ?????????, ?????? ?????????? ??????????????????
 ?????????????.

?? ?????? ?????? ?????????? ?? ?????????? ?????????????? ??????,??? ?????????????? ??????
????????????? ? ?????? ??????. ?? ?????????????? ?????? ?????????????????????????????? ??????????
?????????????, ????????? ?????????????????? ?????? ?????????? ?????? ? ?????? ??????????????????
????????????????? ? ??????????????????????. ? ??????????????, ?????????????? ?????????????? ??????????
????????????? ?????? ?????????? ??????????, ? ?????????????????????? ?????? ?????????? ?????????????? ??-??
????????????????? ?????????????????????? ? ?????????????? ?????????????? ?????????? ??????????????
????????????????????? ?????? ? ? ?????????? ?????? ? ? ?????????? ?????????? ??????????????????
????????????????????????????? ?????????? ? ? ??????????????????

3. ?????????????????? ? ?????????????????? ??????????????????

????????????????????? ?????????????????????? ?????????????????????? ?????????????????????? ? ?????????????????? ??????????????????????
????????????????????????? ??????????, ?????????????????????? ?????????????????????? ?????????????????? ??????????????
????????????????????? ?????????????????????? (????????????????????? ?????????????????????? ?????????? ?????????????????????? (?????)).
????????? ?????????????????????????? ?????? ?????????????????? ? ?????????? ? ? ?????????? ? ??????????????????????
????????????????? ??????????. ?????????? ?????????????????????? ??????????????????????, ?????????? ?? ??????????
?????????, ?????????? ? ?????? ?? ? ?????????????? ?? ?? ? ?????????????? ?????????????????? ? ?????????, ??? ??????
?? ?????????? ?????????????? ?? ? ?????????? ? ?????????????????????? ??????, ? ?????????? ??????????????
????????????????????? ?????????? ? ?????????????????? ?????????????? ?????????????? ?? ?????????? ??????. ? 2000, ?????
????????? ?????? 4,500 ??????????????????. ? ?????????????????? ?????????????????? ?????????? ?????????? ??????????????
????????? ?? ? ?????? (“????????????????? ?????????????????? ??????”)⁴⁹ ?????? ?? ? ?????????????
????????????????????????? ? ?????????????????????????? ??????????????????????, ?????????? ?????????? ?????????????????
?????????????????????, ?????????????????????????? ?????????????????????? ?????????????????????? ?????????? ?????????????.

? ?????????? ?????????? ?????? ?????????? ??????. ?????????? ?????????? ?????? ??????????????????????
????????????????? (????????????? ?????????? ? ?????????? ?? ?????????????????????? ?????????). ?????????? (????????, ??? ?
????????? ?? ?????????????????????? ? ?????????????? ??????????) ?????????????????????? ?? ?????????? ?????????????????????? ??? ???
????? ?????????????????? ? ?????????????????????????????? ?????????????????? ?????????????? ?? ?????????, ?????????????????????? ???
????????????????? ?????????????????????????????? ?????????????? ?????????????? ??????????, ?????????????????????? ?????????? ??????????
??? ?????????????????? ?????????????????? ?????????????????????? ?????????????? ?? ?????????????????? ??????????,
????????????????????????????? ?????????????????? ?????????????????? ?????????????????? ??????????????????????
????????????????? ?????????????????? ?????????? ?????????? ?? ?????????????????? ??????????????????????
????????????????? ?????????????????? ?????????? ?????????? ?? ??????????????????, ?????????????????????? ?? ?????????? ??????????, ?
????????????????? ?? ?? ??????????, ? ?????????? ?????????????????????????? ?????????????????? ??????????????????????
?????????????. ?????????????????????? ?????????????????????? ?? ?????????? ?????????? ?????????? (????????????????????????? ?????????? ??
????????? ?????????????????????? ??????????). ? ?????????????????????? ?????????????? ?????????????? ?????????????????
????????????????????????? ??????. ?????????? ?????????, ?????? ??? ?????????????????????????????????? ?????????? (??
????????????????????????? ? ?? ?????????????????????????? ?????????, ?????????? ?????? ??????????, ?????????????????? ?????????????
?????????) ?????????????????? ??????????. ?????????????????? ? ?????????????????????????? ??????????????????????
????????????????????????? ?????????????????????? ?????????????? ?????? ?? ?????????????????????? ??????????????????????

?? 2000 ??? ?????? ?????????????????? ? ?????? ?? 16 (14 ?????????????, ?????????? ? ??????????) ??????????????
????????? ?? ? ?????????????? ?? ?????????? ?????????????????????????? ??????????. ?????????????????????? ?????????
????????????????????????? ? ?????????????????? ?????????????? ?????????? ?????????????????? ? ?????? 1990-?. ? 2001
????????????????????????? ?????? ?????? ?????????????????? ?????????????? ?????? ?????????????? ??????????. ?????????? ?
2002 ?????? ?? ?????????????????????? ?????? ?????? ?????????????????? ? ?????????? «????????????????????? ??????»

⁴⁹ As in other CAR republics, “imported” concept of EIA was superimposed on the Soviet-era concept of environmental expertise. The result has been unclear regulatory provisions and inconsistent interpretation of how the terms are to be understood and the regulations put into practice.

?????? ????? ? ????????? ????????? ????????????? ????????? ????????? ? ?????????
?????????⁵⁰

?????? ????????????? ????????????? ????????????? ??????? ?????????? ? ??????? ?
?????????????, ? ?????? 1990-? ?????????????? ?????????????? ? ??????????????
????????????????????? ? ?????????????????? ?????????, ? ?? ?????? ??? ??????????? ?? ?
?????????? ??????. ??? ? ?????? ??????????, ?????????? ??????????????
????????????????????? ?????????? ?? ?????? ?????????????????? ?????????? ?????-???? ??????
????????????? (????? ?? ??????????? ?? ?????????) ? ?? ?????????? ?????????????????? ??????
????????? ?????????????????? ??????????????. ? ?????????? ???????, ??????????????
????????????? ?????????????????? ?????????? ??????? «????????????????? ?????» ? ??????????????
????????? ?????????????? ?????????????????? ????????. ? ?????????? ??????, ?????????????? ??
????? ??? ?????????? ??????????????. ?????????????????? ?????????????? MOE ??? ?????? ??
«????» ?????????? ?????????????????? ? ?????? ??????? ?? ?????????????????? ??????
????????????????? ?????????? ? ??????????????. ??? ?????????????? ?? ?????? ??????????
????????????????? ??????, ?? ?????? ?????????? ?????? ?????? ?????? ?????? ?????? ??????

????????????, ?? ??????? ???, ?? ?????????? ?????????????????? ?????????????????? ?????????? ?
?????????????, ? ?????? (1) ?????? ?????????????????? ?? ??????, (2) ?????????????? ?????? ?
?????; ? (3) ?????????????? ?????????????? ?????????????? ?? ?????????? ??????????????????
?????????????????. ? 1999 ?????????? (3) ?????????????? ?????? 90% ?????? ?????????? ??
????????????????? ?????????? ? ??????? 18.9 ?????????? ?????? (\$120 ?????????? ??????????,
?? ?????????????????? ?????? 0.7% ?? ??). ?????????? ?????????? ?????????????? ?? ??????????
?? ?????? 12 ?????????? ?????????? ?? ? (????? ?????? ?????? ?????? ?????????? ?? ??????????
????????? ?? ?????? ?????????????? ?????? - ??? ?? ?????????????????? ? 1999).⁵¹ ?????? ?????
????????????? ?????? ?????????? ?? ?????????????????? ?????????? ?????????? ?????????? ?
????????????????? ?????????, 5% ?? ?????? ?????? ? ?????????? ?????????? ? ?????????????? ??????
?? ?????????? ??????. ?????? ?????????? ?????????? ?????????????????? ??????????????????
????????????????? (? ? ??????????????), ?? ??? ? ?????? ? ?????????? ??????????????, ?????????????
? ?????????? ?????????? ? ?????????? ?????????? ?????, ? ?? ?????????????? ??????????

?? ?????? ?????????????????? ??????? ?????????????????, ?????? ??? ?????????? ??? ?????? ?????
????????? ? ?????? ??????. ?????????? ?????????????????? ? ??????????. ?1999 ??????????????
????????? 2,7 ?????????? ?????? ?? ??????? ?? ?????????????? ??????????, 8,35 ?????????? ?????? ??
????????? ? 8,6 ?????????? ?????? ?? ?????? ?? ??, ?? ?????????????? ?????? 164 ??????????
????????? ?? ?. ?? ??? ?????? ?????????????????? ?????????????? ?????? ?????????? ??
????????????????? ?? ?????????????????? ?????????????????? ?????????? ?? ??? ??????????????????
?????? ?????????? ?????????????????? [?? ??????? ?????????? ?????? ?????????? ?????????
(1991)]. ?????????????? ?? ?????????? ?????????????????? ? ?????????????????? ??????????,
????????????????? ?????????????????? ? ?????????????????? ?????????? ? ?????????????????? ??????????????????
?????????. ?????? ?????????? ??????? ??????????. ?????????????? ?????????????, ??????????????
?????, ?????????? ?????? ?????? ?????? ??????. ?? ?? ?????????? ?????????????, ??????????
????????? ?????????????? ? ??????? ?????? (?????????, ?? ? ? ??????????????????)

⁵⁰ ?????????????????? ?????????????????? ?????????? ?????????? ?????????? ? ?????????? ?????????????????? ?????????? ?
?????????????, ? ??????? ?????????????????? ?????? ? ?????????????????? ?????????? ? ?????????? ?????? ?????????? ??????
?? ??? ?????????? ??????, ?????????????? ?????? ?? ?????????? ?? ?????? ?????? ?????? ??????????????????,
????????????????????? ? ?????????? ?????????????????? ??????, ?????? ?? ??????? ?????? ?????? ?? ??????
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⁵¹ ??????? ??????? ? ??????? ?? ?????????? ?? ?????????? ??????. ?????? ?????????????????? ?????????????? ???
????????????? ? 110 ?????????? ?????? (1.2 ?????????? ?????????? ???) ? 1999 ?? 1,081????????????? ?????? (7.5
????????????? ?????????? ??) ? 2001 ? 1,297 ?????????? ?????? (8.4 ?????????? ?????????? ???) ? 2003.

?????????. ?????????? ?????? ??????? ? ?????????? ? ?????????? ?????????? ?????????? ?
 ?????????? ?? ????? ? ?????????? ?????????????????? ?????????? ? ??????? ??????. ?????? ??????
 ?????????????? ?????????? ?????? ?? ?????????? ?????? ?????????? ? ?????????? ?????????????? ?????
 ?????????????????????? ????? ?????????????? ??????. ?????? (1) ?????????? ?? ?????????? ????? ?
 ?????????? ?? ??????????, (2) ?????????? ?? ?????????? ????? ? ?????????? ?? ?????????? ?
 ??????-????????? ?????? ??, ? (3) ?????????? ?????????? ????? ????? ?? ?????, ?????? ?????
 ?????? ?????????? ?????????????? ?????????? ????? ? ?????????? ?????????????? ?????? ? ?????????
 ?????????? ????? (????????? ???????). ?????????? ?????????????????? ?????????? ??????????
 ?????????????????????? ? ?????????? ?????????????????? ?????????? ??????????????????. ?????
 ?????????? ?? ?????????? ?????????????????? ? ?????????? ?????????? ?????????? ?? ?????? ??????????
 ??????????. ?????? ??????? ?? ?????????? ?????????? ?????????????? ?? ?????????? ??????????????????
 ??????????????????, ?????????????? ?????????? ??????, ?????????????? ?????? ? ?????????? ??????????????????
 ?????????????????? ??? ?????? ?????????????? ?????????????? ??????. ??? ?????????????????? ??????????
 ??????????, ? ?????????? ?????????????????? ?????????? ?????????? ??????????, ? ?????????????
 ?????????????? ?????????????????? ?????????? ? ?????????? ?????????? ? ??????-????????????? ??????
 ?????????????? (????? ??????, ????? ? ?????).

????? ?? ?????? ?????????? ?????????????????? ?????? ? ?? ?????? ? ?????????????? ?????????????
 ?????????? ?????????? ?????????????????? ??????. ??????? ?????????? ?????????? ?????????? ?????
 ?????????????? ??????, ?????????????? ?????????????????? ?????? ? ??????? ?????????? ??????????????????. ??? ? ?
 ?????????? ?????????? ? ?????????????? ?????? ? ?????????? ?????????????????? ??????? ??
 ?????????? ?????????????? ??????. ??? ?????? ??? ?????????????? ?????????? ? ????. ??? ??????????
 ??????? ?? ?? ?????????????? ?????????????????????? ?????????????????? ???, ?????????? ?????????????
 ?????????? ?????????????????? ?????????????? ??????, ?????????? ?????????????????? ?? ?????????????????? ?????????
 ??????, ? ??????? ?????????????????? ?? ?????????? ?? ?????????????????? ?????, ?????????????????????
 ?????????????????????? ??????????????????

? ?????? ? ? ?????? ?????????????? ?????????? ? ?????? ??????????, ?????????????? ?????????????? ??????,
 ?????????? ?????????????????? ?????????????????? ?????????????? ?? ?????????????????? ?????? ??
 ?????????????????????? ?????????? ?????????????? ???????, ?????? ? ????. UNESCAP ?????????? ?????????
 ?????? ? ?????????????????? ?????????????????????? ? ??????????????????

??? ?????????????? ?????????????????????? ?????????????? ?? (?????), ??????? ?????????????????????
 ?????? ?????????????????? ?? ?????????????? ?????????? ?????????????? ? ??????????, ?????????????????? ?
 ?????????????????????? ??????, ?????????? ?????????????????? ?????????????????? ?????????????? ??????????. ?????? ??
 ?????????????? ?????????????????????? ??????????, ?????????????????? ? ??????, ?????? ?????????????????? ????. ???
 ??????? ?????????????????? ?????????????????? ?????????????????? ??????????????, ?????????????? ?? ?????????????????? ??
 ?????????????? ?????????????? ?????? ?????????????????? ?? ?????????, ?????????????????????? ?? ?????????? ?
 ?????????????????? ?? ?????????????????? ???????.

????? ?? ??????? ?????????????? ?????? ?????????? ??????? ?? ?????????? ?? ?????????????? ?????????? ?
 ???????, ?????????? ??????????, ? ?????????????? ??????????, ?????????????? ? ?????????????????? ?????????????
 ? ?????????????????? ?????? (????????? ??????? ? ??????). GTZ ?????????????????? ?????????????? ??
 ?????????????? ?????????? ?????? ? ?????????? ? ?????????????????? ?????????? ??????????????????, JICA
 ?????????????????? ? ???????, ?????????????? ? ?????????????????? ?????????? ?????????? ? ??????????????????
 ?????????????????????, ?????????????? ?? ? ?????? ?????????????????? ? ?????????????????????? ??????????
 ?????????????????? ??????? ?????????? ??????-? ????. ??????????, DFID ?????????????????????, ?
 ?????????????????? ? ?????????????? ?????????????????? ?????????? ?????? ?????? ??????. ?????????????? C
 ?????????????? ?????????? ?????????????????? ??????????

II. ??????????: ?????????????? ?????????????? ??????????

A. ?????????????? ?? ?????????????? ??????????

????????????????????? ?????????????????????? ?????????? ?????????????????????? ? ?????????????????????? ??????????,
????????????? ????? ? ?????????????? ?????????????????????? ??????????⁵⁴ ??????? ?????????? ?????????????????
? ?????????????????????? ?????????? ?? ??????????, ?????????????????? ?????????????? ??????????. ??
????????????? ??????? ?????????? ??? ?????????????? (i) ?????????????????? ?????????????????? ?????????????????
? (ii) ?????????????????? ?????????????????? ? ?????????????????? ???????.

?????????? ?????????????????? ?????????????????? ? ?? ????? ?????????????? ?????????????????? ??????????????????,
? ?????? ?????????????????????? ? «?????????? 21». ? ?????????????????????????????? ?????????? ?? ?????????? ??
????????????????? ?????????? (“?????”) ? ?????????? 2002, ?????????????????????? ?? ?????????????????????? ??
????????? ?????????????????????? ?????????????? ? ?????????????????? ?????????????? ?????????????? ??????????????????
?????????????????: (i) ?????????????????????? ?????????????????? ?????????????????????? ??? ? ?????????????????????? ?
????????????????? ??????????, (ii) ?????????????????? ?????????????????????????????? ??????, ?????????? ?????? ??
????????????????? ?????????????????? ?????????????????? ??????????????????????, ?????????????????? ? ??????????????????????
?????????????, (iii) ?????????????????????? ? ?????????????????????? ?????????????? ?????????????????? ??? ??????????
????????????? ?? ?????????????? ?????????????????? ?????????????? ? ?????????????????????? ?????????????????????? ?????????????
?????????????, (iv) ?????????????????? ?????????????????????? ?????????? ? ??????????, ?????????? ?????????? ??????????
?????????????, (v) ?????????????? ?????????????????? ?????? ? ?????????????????????? ??????? ?????????????????????? ?????????? ?
?????? ?????????? ???????, (vi) ?? ?????????????????? ?????????????????????? ?????????????????????? ?????????????, ??????????
? ??????????, (vii) ?????????????????????? ?????????????????????? ? ??????????, ? (viii) ?????????????????? ?????????????
?????????????. ?????? ?????????????????? ?????????? ?????????? ?????????????????? ??????????????????????
????????????????????? ?????????????? ?? ??, ?????????????????????? ?????????????????? ??, ?????? ??????????
????????????? ?????????????????? ??? ?????????????????????? ? ?????????????????????????????? ?????????????????????? ?
????????????????? ? ?????????????? ?????????, ?????????????? ?????????????????? ?? ? ?????????????
????????????????????????????? ?????????????????????? ? ?????? ?????????????????? ?????????????? ??????????????????

????????????????? ?????????????? ?????????????????? ??????. ???????, ?? ?????????????????????? ??????????????????????
????????????????? ?? ?? ?????????? ??????????????????????, ??????? ?????? ?????????????????????? ?????? ??
????????????????????????????? ??????????. ?????? ?????????? ?? ?????? ?????? ?? ?????????????????????? ?
????????????????-????????????????? (????????????? ?? ?????????????????? ??????). ?????????? ?????????????????? ??????:
?????? ?????????????? ?????????? ?????????????????????? ??????, ?????????? ?????? ?? ?????????????? ???????
????????????????? ?????????????????????????????? ?????????? ?? ?????????????????? ??????????. ??????????????????????
????????????????? ?? ?????????????????????????? ?????? ?????? ?????????????? ?????? ?? ?????????? ?????????? ??????.
????????????????????????? ?????????????????????? ?????? ?? ?????????? ?????????????????????? ??????????????????
????????????? ?????????????? ?????????????????????? ?????????????? ?????????? ? ?????????????????????? ??????????????????????
????????? ? ??, ?????????? ?????????? ?????? ?????????????? ?????????????????? ??????, ?????????????? ?????????
????????????????????? ??????? ?????????????? ?? ??????????????????????. ?????????????? ?????????????? ??????????
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????????, ?????????? ??????? ?????????????, ??? ??????, ??????? ?????????????????? ??????, ?????????????????
????????????????????? ?????????????????????? ??? ?????? ?????????????????????? ?????????? ? ?????????? ?? ???
?????????????, ? ?? ??? ?????????????????????? ?????????????? ?????????????????????? ?????? ? ??????????????, ??????????
????????????????????????? ?? ?????????????????????? ?????????? ? ?????????????? ?????????? ? ??? ? ?????????????? ??????????????
????????? ?????????? ?????? ?????????? ??????? ?????????????????? ??????? ?????????????????? ?????????????? ? ?????????? ?

⁵⁴ ?????????????? ?? 2001 ???, ?????????????????????? ???, ??? ? ?????????? ??????????. ?????????? ?????????????????? ???????
????? ?????????? ? ?????????? ?????????????????? ?????????????????? ? ?????????? ?????????????????? ?????????, ?? ?? ? ??????
????????????????? ?????????????? ?????????? ? ?????????? ??????????. (????????????? E).

????????? ?????????? ?? ??????? «?????-?????????» ?????? ? ?????????? ?????? ??????????,
?????, ??????? ? ?? ?????? ?????????????? ?????????????? ?? ?? ?????????????? ??????????
?????, ?????????????????? ??? ? ?? ??????? ??????? ?????????????? ? ?????? ?????????? ??
????????? ?????????? ??????????, ?? ??????? ?? ?????????? ?????????????????? ?????????? ??
????????????????? ?????????? ? ??????? ?????????????????? ?????????????? ???, ?????, ??????????
?????, ??????????????, ?????????? ??????? ? ??????????? ?????????????????? ?????⁵⁵. ???
?????? ?????????? ?????????? ??????? ??????? ?????????????????? ? ??????????? ?????? ??
?????? ?????????????? ?? ?????????????????? ??????? ?? ?????????????????? ??????????????
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??????, ???????, ?? ?????????????????????? ??????? ?? ?????????????????????? ?? ?????????
????????????????????? ?????? ?? ?? ?? ?? ??????????. ?????????????? ?????????? ?? ?????????? ??????????
????????????????????? ?????????? ?????????????????? ? ??????????? ?????????????????? ?????????? ?
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????????????, ?????????????????? ?????????? ?? ?????????????????????? ?????????? ? ?? ?????????? ? ?????
????????????????????? ??????????????????: ?????????????????? ? ??????????????????. ??????????? ??????????????
????????????? ?????????? (1) ?????????????? ???????????, ?????????????????? ?? ?????????
????????????????????????? ?????????? ??????? ?? ??????????? ?????????????? ?????????????? ?????????? ?
????????, ? ?????? ?????????? ?????? ?????????? ?????????????????? ?????????????????????? ?????????????
(????? ? ?? ?????? ?????????, ? ?????????????????????? ?????????????? ?????????????????? ?????); (2)
?????????? ?????????????????? ?????????, ?????? ?? ?????????????????? ?????? ?? ?????? ??????????????
????? (?????) ? , ? ?????????????????????????? ?????????, ?????????????????????????? ?????????? ?? ? ?
????????????????????????????? ?????????? ?? ?????????????????? ??????? ??????????. ?? ?????? ?????? ?????????
????????????????????? ?????????????????? ?????? ?????????????????? ??????????????????-?????????????. ?????????? ?????,
????????????????????????? ?? ?????????????????? ??????, ?? ?????????????????? ??????????????????????
????????????????? ? ??????. ? ?????? ? ??, ?????????? ??????? ?????? ?????? ?????? ?????????????? ?
????????, ? ??????, ? ?????????????? ?????????????? ?????????? ??????????. ? ?????? ? ?????????????????????
????????????????? ?????????????????? ?????, ?????????????? ?????? ?????????? ? ?????????????????????? ??????????????????
? ?????????.

????????????? ? ??????? ?????????? ?????????????? ?? ?????????? ?????????????????????????? ?????????????
????????????? ?????????? ?????????? ?? ??????? ?????????????????????? ?????? ?????????????????????? ?????????? ?? ?
?????????. ?????? ? ?????????? ?????? ?????????? ?? ?????? ???????, ?? ?? ?????????????????? ??????????
? ???, ?? ? ?? ??????, ?? ?????. ?????????, ?????????????????? ?? ?????? ? ?????????? ?????????????,
? ?????????????????? ?? ?????, ? ?????????????????????? ?????? ?????? ?? ??????????????????, ? ?????????? ?
?????????? ?? ?????????????????? ?????????, ?????? ?? ?????????????????????? ?? ?????????????????????
?????????????????????. ?????????????? ?????? ?? ?????????????????? ?????????????? (????? ?????????????????????
?? ??????? ?????????? ?? ?????? ??????? ??????) ?????????? ?????????????? ?? ??????????????????????.
????????????????????? ??????????????????, ?????????????? ?????????????????? ? ?????????????????? ?????????????? ??????
????????? ?????????????????????? ? ?????????????????????? ??????. ?????????? ??????? ? ?????????????
????????????????????? ?????????????????? ?????????????????? ??????????????. ?????? ??????????????????????
????????????, ??????? ?? ?????????????????????? ??????? ??????? ? ?????? ?????????????????? ??????
????????????????????, ?? ?????????????? ?????????????????? ??????????

????????? ?????????? ?? ??????? ?????????????-????????????????????? ?????? (????????????? 2030 ???
2010) ? ?????? ?????????????? ?????????????? ? ?????????????????? ?????? ?????????????????? ?????? ?
????????????????????? ??????????? ??. ??????, ?????? ?????????????? ?????? ?? ?????? ?????????????? ?????????????
??????, ??????? ?????????????????????? ? ??????????. ?? ?????????????????? ?????? ?? ?????????????????? ??????

⁵⁵ ?????????????????? ?? ?? ?????????? ??????? ?????????????? ?????????????? ?? ?????? ?????? ?????????, ??, ?? ??
????????????? ?? ?????????????????????????? ??????, ? ?? ?? ?????????????????? ?????????.

?????? (???????????????????? ? ??????? ????????? ? ????????? ????????? ?????????, ??? ??
???????????????? ?????????????? ? ????????????????? ?????? ?????????).

?????? ? ????????? ? ????????????????? ??????????? ? ?????? ?????????? ?????????? ? ??????
????????????? ????????????????? ????????????????? ?????????????? ? ???. ??? ????????? ? ?????
????????? ?? ???? ????????????????? ???? ????????????? ?????????? ??, ?????????????????
????????? ? ????????????????? ??????????? ?????????? ????????? ? ???? ??????? ??, ??? ??
?????? ?????? ??????

????????????????? ?????????????????? ?????? ??????? ??? ? ??????? ??? ?????????
????????????? ? ?????????????????? ?????????? ? ??????????????. ?????????? ?????????? ?????????????
????????? ?????????? ?????????????????? ? ?????????????????????? ??????????. ?????????????????
????????????????? ? ?????????? ??? ? ???? ???? ???? ???? ?????????????????? ? ?????????????
?????????????

????????????????? ??????? ?????????????? ??????????? ??????????? ?????? ??????????????????
????????????????????? ?????????? ? ??: (1) ?????????? ?????????????????? ? ?????????? ?????????????
????????????????????? ??????? ?????????????? ?????????????????????????????????? ??? (??? ?????????????????? ?????????
?? ??????????????????) ?????????????? ? ?????????????????? ?????????????????????? ?????????? ??????????
????????????????????? ? ?????????????????? ?????? ?????????; (2) ?????????????? ?????????????? ?????????????????????
????????????? ? ?????????????????? ?????? ???? ?????????????? ?????????? ??????????, ?????????? ? MEP,
????????? ?????? ?????????????????? ?????? ??????????????????????, ? ?????????? ?????????????????????????? ??????????
?????? ?????????; (3) ?????????????????? ?????? ?????????????? ? ?????????? ?????????????????????? ?????????
????????? ??????? ? ???? ?????????? ?????????????? ?????? (?? ?????); ? (4) ?????????????? ??????????
????????????????????????? ?? ?????????????? ??????????

3. ?????????????????? ?????? ?????????????????? ?????????? ? ??????????

?????? ? ?????????????? ?????????????? ?????????????? ??????, ?????????????? ?????????? ??????????
????????????????? ?????????????????????? ?????? ?????????????????????? ??????????. ?????????????? ?????????? ?
????????? ? ?? ?? ??? ??: ?????????? ?????? ?????????? ? ?????????? ?????????????????? ??? ?????? ?????
????????, ?????????????? ? ?????????????? ?????????? ?????????????? ?????????????? ?????????? ??????. ?
?????? ????????? «????????????????????? ??????????????» ? ? ??????? ?????? ??????????????????

C????????????? ??????? ?????????????? ? ?????????????????????????? ?????????????? ? ?????????????????? ?
????????????? ?????? ? ? ?????????????? ?????????? ?????????????????????? ?????????????????????? ??????????.
????????????????????? ?????????? ?????????????????? ?????????? ?????????????????? ??????? ?????????????????? ???
????????????????? ? ?????????????????????? ?????????????? ?????? ?????? ?????????????????? ??????????????
?????? ? ?????????????????? ?????????????? ?? ??. ?????????? ?????????? ?????????????? ? ?????????? ??????? ??????????
?? ??????? ?????? ?????????? ?????????????????, ?????? ??? ?????? ?????????????????????? ?????????? ???
????????? ?????????????????????? ??????????. ? ?????????? ?????? ??? ?????????????????? ?????????? ??????
????????????????? ?????????? ? ?????????? ??????????. ? ?????????? ? ?? ??? ?????????? ??????, ?????? ???????
????? ?????????????? ?????? ? ????

E. ?????????????????? ?????????????????? ??????????????????

????????? ?? ?????? ?????????????, ??? ??????? ?????????????????????? ?????????????? ?? ??????
????????????????????????? ??????????????. ?????????? ??? ? ? ?????? ?????????, ??? ?????????????
????????????????????????? ?????????????? ? ?? ?????????? ?? ?????? ?????????????????? ??. ?????? ?????, ???????
????????????? ? ?? ?????????? ?????????????????? ?????? ?????? ? ?????????????????????? ?????????? ??????????
????????? ?????????????????????, ?????????????????????? ?????? ?? ?????????, ? ?????, ??? ?????????????????????? ?????,
????????????????? ?????????????????????? ?? ?????????? ?????????????? ?????????????????????? ?????? ?????????????????? (??
????????? ?????????????????? ?????????????? ??????????????????????). ?????????? ?????????????????? ?????????? ?????????? ??
????????????????? ?????????????? ?????????????????????????? ?????????????? (????????????? ??????????????)

??????? 2. ???????? ???????? ?????????????? ? ? ?????????? ?????????????? ??????????

???????	????? ???? ?????????????? ????????, ?????????? ? ? ?????? ???
????? ? ?????????? ?????????????? ?????????? ???????	<ol style="list-style-type: none"> ????? ?????, ?????????? ?????????? ?????????? ?????????? ? ?????????????????? ???? ?????????????? ?????????????????? ?????. ????????????? ?????????? ? ?????? ?????? ?????. ????????????????? ??????? ?????????????????? ?????????????????? ?????????? (????????????? ?????). ????? ?????? ?????????? ?????????? ? ?????????? ?????????? ?????? ??? ?????????? ?? ?????????? ?????????? ??????????, ?????? ?? ??? ?????, ? ?????????? ?????????????? ?? ??????????????
???? ?????????? ??????????	????????????????? ????????? (????? 1 ????) ?????? ??????????????
????? ? ???? ? ??? ??????????????	????????????? ?????????????????? ????????? ? ????????? ???????, ??? ? ?????????????????? ?????? provision.
????????? ??????????????????	<ol style="list-style-type: none"> ????????? ?????????????????? ?????????????? ? ?????????????????? ?????????????????? ?????????? ?????? ?????????? ?????????????????? ????? ?? ???? ?????????? ?????????????????? ?????????????? ?????????? ?????? ?????????????? ? ?????????? ????????? ?????? ?????? ? ?????????????? ?????????? ?????????????????? ?????????, ?????????????? ?? ?????????????????? ?????????????? ?? ?????????????????? ??????????????????, ?? ?????? ?????? ?????????????????? ?????????, ?????????????? ? ?????????? ?????????? ????????????? ? ?????????? ? ?????? ?????????.
????????? ???? ? ?????????????????? ??????	<ol style="list-style-type: none"> ????? ?????????????????? ???? ? ?????????????? ?????????? ?????????????????? ? ?????????????? ????????????????? ?????????? ? ??????????????, ?????? ? ? ?????????????? ?????????????? ????????? ?? ?????????? ?? ?????????? ?????????? ?????????? ?????????? ??????????
????????? ?????? ?????????????? ???? ?????? ? ?????????? ???	????????? ???? «?????» ?????????. ?????? ?????? ?????????? ?????? ?? ?????????????????? ??????????????????, ?????????????? ?????????????? ????????? ? ???? ??????
?????????, ??????????	<ol style="list-style-type: none"> ?????????????????, ?????????? ?????????? ? ?????????????????? ?????????????? ?????? ? ??? ? ??????????. «????????» ?????? ?????????????? ???? ?????????? ? ?????????? ?????????????? ?????????? ? ?????????? ?????????? ? ?????????? ??????????, ?????????????? ? ??????????

⁶² ?? ?????? ??? (? ? ?-?? ?????????? ?????? ?????????, ?????????????? ? ??) ?????? ?? ?????????? ?? «????????? ? ?????? ?????????? ???» ? ?????????? ?????????.

???? ?? 3350 (?? ?????? 3) ??????? ??????. ?????? ?? ??????? ?? (1) ?????????????????? ? ?????????? ?? ?????????? ??????; (2) ?????????????? ?????, ?????????? ?? ?????????? ??????????; (3) ?????????????? ??????????; ? (4) ????????????? ?????? ?????????????? ?????????? ? ?????? ??????????????. ?????? ??, ?????? ?? ?? ? ?????????? ?? ?????????? ??????, ?? ????????? ?????? ?? ?????????? ?????????????????? ?????????? ?? ?????????? ?????????? ??????????. ?????????? ?????????? ?????????? ??????

?? ?????????????????? ??????

(vii) ?????????????? ?????????? ?????????????????? ? ?? ?? ?????? ?????? ?????????????????? ?? ?????????????? ??????, ?? ?? ? ?????????? ? ?????? ?????????? ?????????? ?????????????????? ??????. ?????????? ?? ?? 3350 ?????????? ?????????????????? ?????? ? ?????????????? ?????? ??????????????, ? ?????? ?? ?????????????? ?????????? ??????????????, ?? ?????????? ??????????????????

(viii) ?????? «?????? ?????» ? ?????????????? ?????? ??????? ? ?????????????? ?? ?????????? ?????????????? ?????????????????? ? ?????????????????? ? ?????????? ??????. ?????? ??, ?????? ?? ? ?????? ??????? ?????????????, ?????????????? ? ?????? ? ??????, ?? ?????????? ?? ??????????? ??????. ??? ???? ? ???? ???? ?????? ?? ???? ?????????????????? ?????????????????????? ??????????????? ?????. ?? ?? ???? ?????????? ??????? ? ?????? ??, ?? ?????? ?????? ?????? ?????????? ?? ?????????? ?? ?????????? ?????? ??????, ? ??? ???? ?????-???? ??????????, ?? ?????? ?? ?????. ?????????? ? ?????????? ?????????????????????? ?????????? ?????????? ?? ?????? ?? ?????????????? ??????, ?? ? ?? ?????????? ?????????? ?????????????????? ?????????? ?????.

(ix) ?????????? ?????????? ? ?? ?????????????????? ?? ?????? ?? ?????????? ? ??, ?? ???? ?????? ?????? ?????????????????? ?????????? ? ?????? ?? ?????????????? ?????????? ?????????? ??????????. ?? ??????? ?????? ?????????????????????? ? ?????????????? ?????? ? ??, ?????? ?????????????? ?????????? ?? ???? ?????????? ?????????? ??????????????????

(x) ?????????? ??? ? ?????? ?????????????? ?????? ?????????????? ?? ?????????? ??????, ? ?????? ? ?????????????????? ?????????? ?????????? ??????????????????, ?????????? ?????????? ??????? ?? ?????????????? ?????????? ??????????????

(xi) ??????? ???? ?????? ?????????????? ?????????????? ?????????? ? ?? ?????????????? ?????????????????????? ?? ??????, ? ?? ?????? ?????????????? ?????????????? ? ??????????

(xii) ?????????????? ??? ?????????? ? ??? ?? ?????????????? ?????????????????????? ?????????? ?????? ??????, ?? ?? ?????? ?????????????? ?????? ?????????????? ?????????? ?? ?? (?????????, ?????????? ??????????????????????, ??????????????????????, ?? ? ??????).

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(iv) ? ??????? ?? ?????? ?????????? ?????????? ?????????????????? ?????? ?????? ?????????????? ?????? ? ??? ?????????????? ??????????????, ?????? ?????????????? ?????????????????????? ?????, ?????????? ?????? ?? ??? ?????????? ? ?????????????? ??????????

(v) ?? ?????????????????? ??????????????????????, ?? ?????????????? ?????? ?????????????? ?? ??? ?????????????????? ??????????. ? ?????? ? ?????????????????????? ?? ?????????????????? ??????????, ?????????? ?????????????? ? ?????????? ??, ?? ??????? ?????? ?????????????, ?? ??????? ?????? ?????????????, ?????????? ?????, ?? ?? ?????????????? ?????????????????????? ?????????? ?? ?????????? ?????????? ?????????? ?????????????? ?????????????????? ?????????????? ?????????? ?????????????? ?????????? ?????? ?? ?????????? ? ?????????? ???. ?????? ?????????????????? ??????????????????, ?????????, ?????????????? ?????????? ?????? ?????? ?????? ?????? ?????? ?????? ?????? ?????? ?????? ?????? ??????

(vi) ?????????? ?????????????????? ?????????????????????? ?????????? ?????????, ?????? ? ?????????? ??????????????. ? ?????? ? ?????????????? ?????????, ?????? ??????? ?? ??????????????. ??????????????????, ?????????? ?????????? ?? ?????????? ? ?? ? ? ?????????? ??????????

???????? ?????????? ???????, ?? ? ? ? ?????????????????, ?? ? ? ??????? ???????.
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(iii) ????? ? ? ????????????? ?????????? ? ???? ? ? ????????? ? ????????? ? ? ?????????
?????? ? ??????, ? ? ? ? ????????? ? ???? ? ? ????????????????? ?????????. ?? ??????
???? ?????⁶⁴. ?????????? ? ?????????????????????? ???? ??????? ? ? ????????????????? ?????
?????? ???? ??????. ?? ? ? ? ?????????????????????? ? ???? ???? ???? ???? ????
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(iv) ?? ???????, ?????????????? ????????? ?????????????????? ?? ?????? ??????????????
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??????????, ? ??????? ? ?????????? ?????????, ?????????? ? ??????? ???????, ? ??????
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?????? ???? ? ???? ???? ???? ???? ???? ? ???? ???? ?????????????? ???????, ? ?
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(v) ?????????????? ? ???? ? ? ???? ???? ? ? ?????????????????? ?????????????? ?????? ????
?????????, ? ?????????? ? ?????????? ?????????????????, ?????????????, ????????????? ?
????????????????? ??????, ???? ?????????????? ?????????????? ?????????? ? ?????????????? ???? ? ?
????????? ? ?????????????????????? ??????? ??????????????. ?????????????? ???????, ?????????? ? ?
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(vi) ?????? ?????????????? ?????????????????? ?????????????????? ??????? ?????????????????? ????,
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????????? ???? ?????????????? ? ? ?????????????? ?????? ? ? ?????????????? ??????????????????
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(vii) ?????????????????????? ?????????? ?????????? ??????? ???? ??????? ? ? ??????? ??????????????????
?????????. ?? ? ? ??????? ? ? ?????????????????? ?????????????????? ???? ??????? ??????????????????????
????????, ??????? ??????????????, ? ?????????????? ??????????????. ?????????????? ?
????????????????????? ?????? ???? ???????, ? ? ?????????? ? ?????????????? ?????????????
????????????????? ?????? ???? ??????????. ?????? ?????? ? ?????????????? ?????????? ??????
????? ?????? ? ?????????? ? ?????????????????????, ??????? ?????? ? ?????????? ?????????.

(viii) ?? ?????????????????????? ??????????, ?????????? ?????????? ??????? ??????????????, ?????????????
? ? ???? , ??????? ? ? ?????????????? ? ? ???? ???? ???? ? ?????????????? ? ? ???? ????
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?? ?????????? ? ? ?????????????????? ? ?????????????????????? ??????????????????:

⁶⁴ ?????? ? ? 3350 ? ? ???? ? ? ? ?????????????? ??????? ?????????????????? ??????. ??? ? ? ? ? ? ? ? ? ? ? , ?
????? ? ?????? ?????? ? ?????????????? ?????????????? ? ?????????? ?????? ??????? ? ? ??????????. ?????? ????
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- (vi) ?????? ?????????????, ?????????????? ??????, ?????? ? ?????????? ? ?????????????? ? ?????????? ? ? ? ? ?????????????????? ?????????????? ?????? ? ? ? ?????? ?????????? ?????????????????? ? ?????????????? ??????, ? ? ? ? ? ?????? ?????????? ?????????????, ????????? ???? ?????????? ????????? ?????????????.
- (vii) ?????????? ?????????????? ??????????, ?????????????? ?????????????? ?????????? ? ??????????? ?????? ?????? ?????????? ? ? ?????????????? ?????????????????? ??????????????????
- (viii) ?????????????? ?????????????? ?????? ?????????????? ? ?????????? ?????? ?????????? ?????????????? (??), ? ? ? ? ?????, ?????????? ? ?????????? ?????????? ?????? ?????????????.
- (ix) ??? ?????? ??? ?????????? ?????????????? ?????? ? ? ? ?????? ??? ?????????????????? ?????????????????? ?????????????? ???. ?????? ?????, ??? ??? ?????? ?????????? ?????????? ? ?????????????????? ? ??? ??????
- (x) ??? ?????????????? ?????????? ?????????? ?????????? ?????????????????? ?????????????????? «????????????», ?????? ?? ?????? ???????. ?????????? ?????? ?????? ?????? ?????????? ?????????? ?????????????? ? ??????????????. ? ?????????????, ?????????????????? ?????????????????? ? ?????????? ?????? ?????????????????, ? ? ? ?????????????? ?????????? ?????? ?????????????? ?e. ?????????????? ?????????????? ?????????? ? ? ?????????? ?????????? ?????? ?????? ??????

????????? ??? ?????????????????? ?????????????????? ????????????????????????? (?? ? 14000), ?????????????????? ?????????? ? ?????????????????? ?????????????????????? ?????????????? ??????????????, ?? ?????????? ?????????????????? ?????????-????????????????????? ?????????????????????, ??????? ????? ????????????????

??????? ? ?????????????????? ?????????????????????? ?????????????????? ?????? ? ? ? ?????? ?????????????????, ?????????????????? ???. ?????? ? ? ?????????????????? ?????? ?????????????? ?????????????? ??????????, ?????????????????? ?????? (????? 1406-???), ?????? ?????? ? ?????????????? ?????????????? ?????????????? ? ?????????????? ?????????????? ? ? ? ? 1995 ? ?????????????? ?????? ?????????? ?? ?????? ?????????????????????? ? ?????????? ?????????????????? ?????????????????????? ?????????????????? ?????????????????????? ?????????????????? ??. ?????????? ?????????? ?????????????????????? ?????????????????????? ?????????????????????? ?????????????????????? ??????????????????????

?? 2448 (?????????? ?????????? ??????? ? ?) ?????????????????? ??? ?????????????????? ?? ?????????????????????? ?????????? ? ?????????? ??????????????????, ?????????????? ?????? ?????? ?????????????? ??????????????, ? ?????????? ? ?????????????????????? ?????????? ? ?????????????????? ?????????????????????? ??????????????????????

??? ?????????? ?? 3633 (?????????? ??????? ?????????? ? ??????????) ?????????????? ?????????? ?????????? ??? ??????, ?????????????????? ?????? ? ? ? ? ?????? ?????????????????????? ?????? ??? ?????????? ?????? ?????????????? ?????? ??. ?????? ??? ?????????????????? ?????????? ?????????????????? ?????????????????????? ?????????? ??? ?????????????????? ?????????? ?????????????????? ?????????????????????? ?????????????????????? ?????????????????????? ?????????????????????? ?????????????????????? ??????????????????????

????, ?????????????? ? ?????????????? ? ?????????????????? ??????????????, ?????? ?????????? ?????????????? ?????? ? ? ??????????????, ?????????? ? ?????????????????? ??????????????????, ?????????????? ? ?????????????? ?????????????? ?????????? ? ?????????????? ?????????? ? ?????????????????? ??????????. ??? ?????? ?????, ??? ?????????????????? ?????????? ? ??????????, ?????????????? ? ?????????????????? ??????????????, ?????? ?????? ??????????? ? ?????????? ?????????? ?????????? ??????????

??? 5860 ?????? ?????????? ?????????????????? ?????????????? ? ?????????? 1990-2000. ??? ?? ??????, ?????????????????? ?????????????????????? ??????????????????, ? ? ? ? ? ??????????, ??? ?????????????????????? ??????????

??????? ? ? ? 5878 (????????????????? ?????????????? ? ? ? ? ? ?) ?????????? ?????????? ?????????????????????????????????? ?????????, ??? ? ?????? ? ?????????? ??????????????, ? ?????????? ??????????????

???????? ???? ?????-?????????. ?????? ??? ?? ????? ????????????????????? ????????? ??
??, ??? ?????????? ??? ????????? ?? ??? ?????? ??? ? ?? ? ???????????????.

?????? ?????????? ??? ????? ????????? ????????? ?????????, ?????? ????????? ?????????. ??? ?? ??????,
?????? ?????????????? ????????? ??? 5972 (?????????), ? ????????? ????????? ?????????????? ??
????????? ?????? ????????? ?????????????????? ?????????? ?? ?? ?????????????????? ?????????????? ? ??????????
????????????????????? ?????????? ? ?????????? ?????????, ?????????? ?????????????????? ??????????
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????????????? ?????????? ??????????????. ?????????????????? ?? ?????????????? ?????????????? ?????????????
?????????, ?????????? ?????????????????????????????? ?????????????????????? ? ?????????? ?????????????? ?????????? ? ??
????????? ? ?????????????????????? ?????????????? ? ?????????????????? ?????????????? ? ????. ?????? ??????????????
????????????? ??????????. ? ?????????????? ?????????? ??? ??? ?????????? ?????????????? ?? ??????????????????
?????????. ? ?????? ?????????? ??, ?? ?????????????? ??? ??, ??? ?? ?????????? ?????????????????? ??????
????????????? (????????? ??) ??? ??? ?????? ?? ?????? ?????????? ?????????? ?? ??? ??????????????
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?? ?????????? ?????????? ?????? ??????: ??????, «?????????????????» ?????????? ?????????? ? ?????????
????????????????????? ??????????????. ?????????????????? ?????????????? ?????????????????????? ?????????? ?? ??????
????????????? ? ?? ??????????????. ?????? ?? ? ?? ?????????????? ?????????????? ?? ?????????????? ?? ??? ??
????????????? ?????????? ?????????? ?????? ?????????????????????? ?????????????????????? ? ??????????
?????????????????. ? ?????????????? ? ?????????? ?????????????? ?????????????????? ??????????????
????????????????????????? ?????????, ?????????????????? ?????????????????????? ?????????????????? ??????????, ??
????????????????????????? ?????? ?? ?????????????????? ??????????????????, ?????? ?????????? ??????????????
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??????, ?????? ? ??????????, ?????????????? ?? ?????????, ?????????????????? ?? ??????????????????
????????????, ? ?? ?????? ? ???. ?????? ???, ?????? ?????????????????????? ??????? ?????????? ?? ?????? ??
????????????????? ??????, ?? ? ?? ??????????????????, ?????????????, ?????????????????? ?
????????????????????????????? ?????????????, ? ?????? ?? ?????????????????????? ?????????? ?????????? ??
?????????????????????????????. ?????? ?????????? ?????????? ?????????????????? ?????????? ? ??????????, ? ??
?????????????. ?????????????? ??? ?? ?? ?????? ?????????? ?????????????? ? ?????????, ??????????
????????????????????? ?? ?????????? ?????????????????? ?????? ?????????????? ??????????. ??? ? ????
????????????? ?????????????????? ?????????? ?? ?????????????????? ?????????????????????? ??????????????????????
(????????????????? ?????????????????? ?????? ?????????), ??? ?????? ?????? ??????????????. ???
????????????? ? ?????????????? ?????????? ?? ?????????????? ?????????????? ?????????????? ?? ??????
????????? ?????????????? ? ??????????, ? ?????? ?? ?????????, ??? ?? ?????????? ??????????????????
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1. ?????????????????? ?????????????????? ???

?????????? ? ? ??????????, ?????????????????????? ?????, ??? ?????? ?????????????????? ?? ?????????? ?? ?
????????????????????????????????? ?????????????????? ??, ?? ?????? ?????????????????? ?????? ??? ?????? ?
????????????????? ??????????????, ?????? ?? ??????????????. ?????????????????? ?????????????? ?? ??????????
????????????????? ? ?????????? ?????? ?? ? ?????? ?????? ? ?????? ?????????? ?????? ?????? ??????????
??? ?? ?????????????? ?????? ?????????????????????? ?????????????????? ?????? ?? ?????? ?????????????? ? ??:
(1) ?????????? ?????????????????????????? ?????: ??? ?????? ?????????? ?????? ? ?????????? ??????,
????????????????? ? ????. ? ?????? ?????? ?? ?????????????? ?? ?????????????????????? ??????????????????
????????????? ?????????????? ?????????? ? ?????????????????????? ??????????????????, ?????????????????? ?? ??????????
????????????, ??? ?????????? ?????????????????? ?????? (????????? ?????????). (2) ?????????? ?????????
???????????? ? ?? ??????????????: ??? ?????? ?????????????????? ?????? ? ??????????????????????
????????????????????? ?????????? ? ?? ??????????????, ? ?????????? ?? ?????????????? ?????????? ?????????????? ?

????????? ?????????? ??????, ? ?????? ?? ?????????? ?????????? ??? ?? ?????? ?????????, ??? ?????????? ?????? ???. (3) ?????????? ?? ?????????????? ?????? ? ?????????: ? ??????? ?????????????? ?? ?????? ?????????? ? ?? ?????? ?????????? ?????? ? ?????? ?????? ????. (4) ?????????????? ?????????????? ????????? ? ?????????????? ??????????: ?????????????? ??????? ? ?????? ?????????? ?? ?????????? ?????????????????????? ?????????, ?????????????? ?????? ? ?? ??????????, ?????????? ?????????, ?????????? ?? ?????????????? ? ?????????? ?????????????? ?????????? ?????????? ??????. (4) ?????????????? ?????????????? ??????????????????: ?????????? ?????????????? ?????? ? ?????????????????????? ?????????? ? ?? ??????????????????. ?????????? ?????? ?????????????? ?? ?????? ?????????????????????? ?????????? ? ??????????. ??? ? ?? ? ? ?????????????? ?????????? ? ?????????? ? ?????????????????????? ?????????????????? ??????????, ?????? ?? ?????????? ?????????? ?????? ? ?????????? ?????????????? ?????????????? ?????????????? ?????????? ?????????? (?????? ?????????????) ? ? ?????????? ?????????????? ?????? ??????????. ? ?????????? ?? ?????? ?????? ? ?????? ?????????????? ??????????, ?????? ?? ?????????????????? ?????????? ????????? (????????), ? ?????????? ?????????????? ?????????? ?????? ?????? ?????? ?? ?????????????? ?????????????? ?????????????? ?????????????? ??????, ?????????????? ?????????? ?????????????? ?????????????? ??????????

????????????????? ?????? ?? ?????????, ?? ?????????????????? ?????? ? ?????????-?????? ?????? ?????? ?????????? ? ??????????????????????. ?????? ?????????????????? ?????????? ?????? ?? ?????????? ?? ?????????? ?????????? ? ?????????, ??????? «????????????????????? ??????» ?-?? ?????????? ??????, ?????????????? ?? ?????????????????????? ?????????, ? ?????? ?????????????????? ??????????????????. ?? ?? ?????????? ?????????? ?????? ? ?????? ??????. ?? ?? ?????, ?? ?????????????????? ?????????? ?? ?????????????? ?????? ??, ?????? ?????????????????? ?????????????? ?????????????? ?????????????? ?????? ??????????????, ?????????? ? ?????????? ?????????????? ??????????

B. ?????????????????? ?????????? ? ?????????? ?????????? ???

?????? ?????? ?????????? ??????? ??? ??? ?????????????? ?????????????? ?????????????????? ??????. ?????? ?????????????????? ?????, ?? ?????????, ?? ????????? ?????????? ??????????. ? ? ??????? ?????????????????? ?????? ?????????? ??? (????????????????? ????? ?? ?????? ?????????? ?????? ?? ??????, ?????? ?? ?), ?????????? ??????????, ?????????? ?????? ?????? ?????? ??????????. ?????? ?????? ?????????????????? ?????? ?????????????? ?????????? ?????????? ?????? ?? ?????????? ???, ?????????????? ?????? ?????????? ?? (1) ?????????????? ?????, ?????????????????? ?? ?????????? ??????????, (2) ?????????????? ??????????, ? (3) ?????????????? ??????????????.

?????????, ?????????? ?????, ?????????? ? ?????????????????? ?????????? ??? ?? 2002, ?????????? ?????????? ?? ?????? ??????????: (1) ?????????????????? ?????????????????? ?????????? ?? ?????????? ??????????; (2) ?????????????? ?????????? ?????? ?????????????????? ?????????? ?? ?????????????????? ??????; (3) ?????????????? ?????????????? ? ?????????????????? ?????????????????????? ?????????; (4) ?????????????????? ?????????????? ??????????; ? (5) ?????????????? ?????????????????? ?????????? ? ?????????????????? ????. ? ?????????????? ?? ?????? ?????????????? ?? ?????? ?????????? ?? ?????????? 1, 2, 3, 4 ? 5. ?????? ?? ?????? ?????????????? ?????????????? ? ?????????????? ??????????:

- ???????? 1: ?????????? ?????????? ?? ?????????? ??????????
- ???????? 1: ?? ??, ?????????????? ? ?????????? ?????????????????? ??????????
 - ???????? 2: ?????????????????? ?????????????? ??????????
 - ???????? 3: ?????????? ?? ?????? ?????????????? ?????????? ? ?????????????? ?????? ?????????????? ??????????
- ???????? 2: ?????????????? ?????????? ? ?????? ?????????????????? ?????????? ?? ?????????????????? ??????
- ???????? 1: ?????????????? ?????????????????? ??
 - ???????? 2: ?????????????????????? ?????????????????? ? ?????????????????? ??????????????????
 - ???????? 3: ?????????? ?????????????? ?? ?????????? ? ?????????????????????? ??????????????

?????? 4: ??????? ?????????? ? ?????????????? ???
 ??????? 5: ????????? ?????????????? ? ??? ?????????? ??????????????????

?????? 3: ?????????????? ?????????????? ? ?????????????? ?????????????????????? ?? ???????

?????? 1: ?????????????? ?????????????????? ?????????????? ?? ??????????
 ??????? 2: ?????????????? ?????????????? ? ?????????????????????? ?????????????? ?? ?????????? ??????????

?????? 4: ?????????????????? ?????????????? ??????????????

?????? 5: ?????????????? ?????????????????? ?????????????? ? ?????????????????? ???

?????? 1: ?????????????? ??????? ?????????? ?? ??????
 ??????? 2: ?????????????????? ?? ?????????????????? ???????
 ??????? 3: ??? ?????????????? ?????????????????????? ? ?????????????? ??????????????
 ??????? 4: ?????????????? ? ???????
 ??????? 5: ?????????????????? ?????????????????? ??????????????????
 ??????? 6: ?????????????????? ??????? ?? ??????? ??????????????????

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<p>?????????? ?????????????????? ?????????? ? ?????????? ???</p>	<p>????????????????????? ? ??????????</p>	<p>????????????????????? ?? ??????????????</p>
<p>???????? 1: ?????????????? ?????????????? ??? ?????????????? ??????????????</p>		

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<p>?????? 2: ??????????? ????????? ????????</p>	<p>????????? ?????????????? ?? ?????????? ????????????????? (???????? ????, ?????????? ?????????? ?????????) ??????? ????????? ?????????, ?????? ?? ?? ????? ?????????, ? ?????? ?????? ?????????? ?? ????????? ??.</p>	<p>??????) ?????? ??? ?????????? ?????????. ?? ?????????? ?????????? ????? ?????? ?????????????? ?????????? ????????????????? ????? ?????????? ?????? ??? ????????????????? ?????????? ?????????. ????????????? ?????????–???????? ????? ????????? ?????????? – ?????? ????? ?????. ?? ?????????? ? ?????????? ????????? ??? ???? ? ?????????? ??? ???? ? ????????? ?????????????????? ?????????? ?????????</p>
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<p>???????? 3: ?????????????? ?????????????? ? ?????????????????? ?????????????????????????????????? ???????</p>		
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1. ????????????????????? ??????????? (???)

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????????????? ??? (?? ?????????????????? C), ??? ?????????????????????? ?????????? 1592 ? 1593
(????????????????? ?????????? ?????????????? ? ?????????????? ?????????????? ??????????), ?????????? 1779 ?
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????????????? 2003 ?????. ??? ?????????? ?????????? ?????? ??????, ?? ?????????? ?? ?????????????????
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????????????? ?????????? ?????????). ??? ??? ? ??? ? [????????? ?????????? ? ????????? ??? 5972
(?????????)]⁶⁵ ?????????? ?? ?????????? ?????????????? ?????????????????? ??????????????
?????????, ?????????? ?? ?????, ?????????????????? ?????????????????????? ? ??????????????????????
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⁶⁵ ?????????? ?????????? ?? ?? ?????????? ?????????????????? ?????????????? ?????????? ?????? ?????????? ?????? ? ?????? III.
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????????? ?? 3350 ?????? ? ?????????? ?????????? ?????????? ?????????????????? ??????????,
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**C. ?????????????????? ? ?????????????????????? ?????????????? ? ?????????
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 ?????????????????? ?? ?????????? ???????; ? (3) ?????????????????? ?????????? ?????? ??? ?????????
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D. ?????????? ??????????????

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(SST: OTH 99036 of 2001) ?????????? ?? ? ?????? ?????????????????? ?? ? ??
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E. ?????????? ? ??????????????

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????????????????? ?????????????????????? ?????????? ?? ??????????. ?????????????????????? ?????????????? ?????? ?
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????????? ? ???, ??? ?????????????????????? ?? ?????????? ?????????? ?? ?????? ?????????????? ?????????????
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????????????????? ?????????????????????? ? ?????????? ?????????? ?????????? ??, ?? ???? ????????? ? ?? ??????
?????????, ? ?????????? ?? ?????????? ?? ?????? ?????????????, ?? ?????????????????? ?????? ?
?????????????????????. ?????????????????? ?????? ?????????????? ? ?????????? ?? 5941 ?? ? ?????????????????????
?????. ?????????????????? ? ?????????? ?????????? ? ?? ? ? ?????? ?? ?????????????????, ?????????????,

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?????? ??????, ??????? ?????????????????? ?????? ?????????? ?????? (1) ?????????? ?????????????????? ?????????????????? ? ?????????????? ??????? ?? ?????????????????? ?????????? (2) ?????????????? ?????????????? ?????? ?????????????????? ?? ?????????? ??????????????, ?????????? ?????? ?????????????????????? ?????????? (3) ?????????? ?? ?????????????????? ?????????? ?????? ?????????? ?????????????? ?????????? ?? ?????????????? ??????? ??????????; (4) ?????????? ?? ? ?????????????????? ?????????, ?? ? ?????????????? ?? ?????????????????? ??????????; (5) ?????????? ?? ?????????? ? ??? ? ?????????????? ?????????? ??????, ?????????? ?????????? ??????, ?????? ?????? ?????????? ? ??????????????????.

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????????, ?????????? 6 ??? ? ?????????? ??????? ?????????????????????? ?????????????????? ?????????????? ?? ? ?????????? 2003-2006.

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Legend:

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INSTITUTIONAL STRUCTURE OF ENVIRONMENTAL MANAGEMENT IN KAZAKHSTAN

Given in Figure 1 below is a simplified organizational structure of the Ministry of Environment as of July 2003. This structure has been in existence for less than a year following the January 2003 organizational reshuffle that separated “production” ministries (agriculture, minerals and mining) from MEP. Clear is the intention to enhance the economic and sustainability considerations in the overall approach to environmental management.

Figure 1: Organizational structure of the Ministry of Environment, July 2003

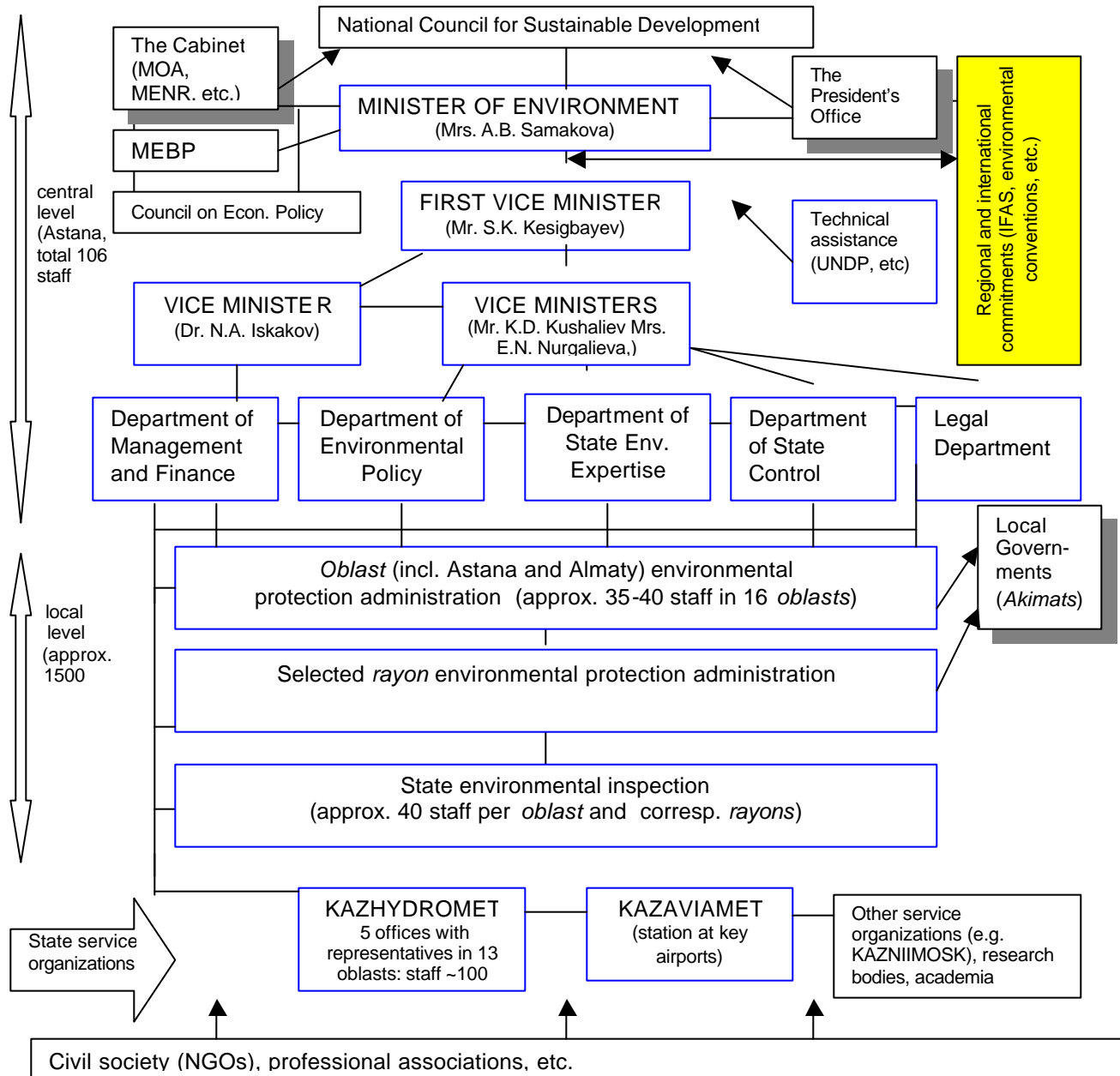


Table 1: Principal Environment-Related Government Agencies in Kazakhstan and Personal Contacts

Name of Agency	Main Environment-Related Responsibilities	Contacts, July 2003	Telephone
Ministry of Environmental Protection	Overarching responsibility described in the 1997 Environmental Protection Law, i.e. to maintain environmental safety, prevent economic and private activities having harmful impacts, preserve biodiversity and ensure efficient use of nature. To manage env. emergency situations and env. disaster zones (now Aral, Semiplatinsk), be in charge of env. education and several others. To manage international environmental commitments and programs.	Aitkul Baigazievna Samakova, Minister Sultangali Kabdenovich Kesikbayev, First Vice Minister Nurlan Abdildayevich Iskakov, Vice Minister Khakim Duyseshenovich Kushkaliev, Vice Minister Enlik Nurgalievna Nurgalievna, Vice Minister Atamurat Muralievich Shamen, Director of Environmental Policy Department Alexander Gennadievich Bragin, Deputy Director of Environmental Policy Department and Advisor to the Minister Galymzhan Karaknovich Seitov, Director of Management and Finance Department Valeriy Chimbenovich Pan, Head of Section of Budget Planning and Expenditures, Department of Management and Finance	59-19-72 59-19-68 59-19-39 333-226-48-12 59-19-54 59-19-53
Ministry of Economy and Budget Planning	-Overall responsibility for taxation and pricing of natural resources -Management of pollution revenues -Approvals and allocation of budgets for environmental management	Kairat Nematovich Kelimbetov, Minister Natalya Artemovna Korzhova, First Vice Minister Arman Galiaskarovich Dunaev, Vice Minister Batyrkhan Arysbekevich Isayev, Vice Minister Erbol Turmakhanovich Orynbayev, Vice Minister Serik Boranbayevich Zhanbekov, Head of Section of Environmental Protection, Department of Cross-sectoral Expenditure Planning	71-77-79 71-77-02 71-77-55 71-81-76 Fax 71-81-15
Ministry of Agriculture	-Formulation of policy towards land and water management; -Implementation of agriculture, irrigation, drainage, and water supply investments -Salinity control -Inter-sectoral and international water allocations -Flood control and water conservation -Oversight and coordination of the work of river-basin authorities - Management of forests, fisheries and hunting -Management of national parks and bio-reserves	Akhmetzhan Smagulovich Yesimov, Minister Askar Isabekovich Myrzakhmetov, First Vice Minister Liliya Sakenovna Musina, Vice Minister Akhylybek Kazhigulovich Kurishbayev, Vice Minister Dulat Nulievich Aitzhanov Anatoly Dmitrievich Ryabtsev, Chairman of the Water Resources Committee, National Coordinator of Water Sector Projects Kopbosyn Kudaibergenuly, Deputy Chairman Shagon Kemelbekovich Kemelbekov, Deputy Chairman Murat Musatayev, Chairman of the Fisheries Committee Alexander Kulganatovich Amanbayev, Acting Chairman of Forestry and Hunting Service Committee Myrzabek Smagulovich Akhmetov, Deputy Chairman Igor Alexandrovich Koval, Deputy Chairman	32-37-63 32-39-73 32-37-84 32-40-60 32-18-82 59-19-21 fax 59-19-22 32-67-13 32-67-13 32-67-13
Ministry of Energy and Mineral Resources	Policies on energy use and pricing (the latter with MEBP), including renewable energy; Promotion of energy efficiency; Management of prospecting and mining activities; Collection of mining royalties and other extraction-related taxes. Management and protection of groundwater; Administration of EIA submissions to MEP	Vladimir Sergeyevich Shkolnik, Minister of Energy and Mineral Resources Nurgali Sadvakasovich Ashimov, First Vice Minister of Energy and Mineral Resources Byrlyk Yesserkepovich Orazbayev, Vice Minister of Energy and Mineral Resources Lyazzat Ketebayevich Kiinov, Vice Minister of Energy and Mineral Resources Timur Zhantikin, Chairman of Committee on Atomic Energy Murat Ramazanov, Chairman of Committee on State Energy Inspection Bulat Uzhkenov, Chairman of Committee on Geology and Mineral Resources Protection	78-68-01 78-68-03 78-68-89 78-68-90

Notes to Table 1:

1. The table is not intended to be exhaustive. There are other agencies having environmental responsibilities (especially KAZHYDROMET for most environmental monitoring, Ministry of Health and its Sanitary and Epidemiology Agency for environment-related health impacts, Ministry of Industry and Trade to promote industrial efficiency but also Ministry of Education and Science, Agency on Land Resources, and State Committee on Emergency Situations. If these agencies' functions are not described here in detail it is not to doubt their relevance. Even more important, perhaps, the table omits the role –well known but often forgotten—that elected bodies play in environmental policies. In general, *Majlis* and its local equivalents approve the environmental policy and its reforms and approve budgets. Parliamentary environmental committees exist at both the central and local levels to support the legislative technically and to communicate with the constituencies on environmental matters.
2. The table focuses on the executive branch of the Government. Important to bear in mind that many responsibilities of the executive are implemented by *local* executive bodies, i.e. *oblast* (and some *rayon*) *akimats*. *Akimats* have decision-making powers over a number of environment-related decisions such as the rates of pollution charges to apply within their territories. Local governments are also in charge of activities such as municipal water supply and wastewater treatment, through municipal water management companies (“*Vodokanals*”). In other cases, powers are divided or subject to approval by the national ministry. The extent of decentralization in environment-related matters is now under intense discussion in Kazakhstan and is referred to in the text.
3. Neither Figure 1 nor Table 1 can fully capture the links of the environmental regulator with other agencies of the government and the society at large, and the number of different –and frequently changing-- regulatory provisions that MEP needs to respond to. Interested reader is referred to Scott Wilson Kirkpatrick & Co. (2002) for an attempt to capture this complexity.
4. The text mentions frequent turnover of the staff of key environment-related agencies of the government. It is unlikely that all persons listed in the table as of July 2003 would hold the positions indicated in the table for very long or indeed that they would continue to serve in the Government.

KAZAKHSTAN: SELECTED ENVIRONMENTAL DATA AND TRENDS

The text referred to ADB (1997), UN ECE (1991), and Scott Wilson Kirkpatrick & Co. (2002) as well as the principal environmental plans (NEAP, REAP) as the main sources of data on Kazakhstan's environmental quality. *Environmental Statistics* (2001) are a useful source of information on decade-long (1990-2000) trends. Monthly monitoring reports of KAZHYDROMET are an indispensable (even if incomplete) source. The chief criticisms of this CEA with respect to data is not that there is a shortage of them but rather that their collection and analysis are not driven by demonstrated need and that purposeful analysis lags behind mere compilation.

Without claiming to be anything more than a rapid overview, reproduced below is a selection, cross-referenced to the contents of the CEA.

A. Principal Social Indicators of Relevance to Environmental Management

Table 1: Kazakhstan: Selected Social Indicators, 1990–2000

	Unit	1990	Mid-1990s ¹	2000
Real GDP (at US\$)	1990=100	100.0	61.4	69.3
Total Population	'000s	16,298.0	15,957.0	14,896.0
Rural Population	% of total	42.9	44.3	44.1
Average Life Expectancy	years	68.1	63.7	65.4
Average Male Life Expectancy	years	63.3	58.4	59.8
Number of Doctors	per 10,000 population	66.2	60.1	49.0
Hospital Beds	per 10,000 population	227.8	192.6	101.6
Access to Drinking Water (In Northern Kaz. Oblast)	% of population	n.a.	n.a.	73.0 (48.3)
Households Without Access to Centralized Water Supply	% total			20.0
Rural Households Without Access to Safe Drinking Water				50.0

Source: Selection from *Ekologicheskaya Statistika*, Kazakhstan Statistical Office, 2001.

Note: For a number of variables affected by the initial difficulties of the transition period, comparisons starting in 1990 (used here) are inevitably less favorable than those that begin in mid-1990s.

References in the text: paras. 4, 6, and 19.

¹ Throughout this appendix, where available, a 1995 figure is used. In other cases, a figure from either 1994 or 1996 is substituted.

Table 2: Kazakhstan: Land Use and Agriculture Development, 1990–2000

Item	Unit	1990	mid-1990s	2000
Cultivated Land, All Crops	'000 ha	35,182	28,680	16,193.0
of Which Grains		23,355	18,878	12,438.0
Head of Livestock	Million heads (including cattle, sheep, goats, horses, camels)	47	29	15.0
Area of Irrigated Lands	'000 ha	2,379	2,381	2,228.3
Water Per Irrigated Land	m ³ per ha per annum	9,129	6,921	4,679.0
Use of Mineral Fertilizers	'000 tons	672	36	11.0
Cultivated Land, All Crops	'000 ha	35,182	28,680	16,193.0
of Which Grains		23,355	18,878	12,438.0
Use of Organic Fertilizer	'000 tons	22,445	1,140	175.0

ha = hectare, m³ = cubic meter.

Source: *Ekologicheskaya Statistika*, Kazakhstan Statistical Office, 2001.

References in the text: paras. 16 to18.

B. Water

Table 3: Kazakhstan: Withdrawals and Use of Water 1990–2000

Item	Unit	1990	Mid-1990s	2000
Water: Total Withdrawals*	Million m ³	36,597.0	28,807.0	19,830.0
of which Kyzylorda Oblast		6,603.0	4,977.0	3,889.0
South Kazakshtan Oblast		5,326.0	4,439.0	3,118.0
Almaty Oblast		6,922.0	5,250.0	3,555.0
Water: Total Consumption		30,286.0	23,434.0	14,678.0
of which Irrigation and Agriculture		21,718.0	16,478.0	10,425.0
(As % of Total)	%	(71.7)	(70.3)	(71.0)
Area of Irrigated Lands	'000 ha	2,379.0	2,381.0	2,228.3
Water Per Irrigated Land	m ³ per ha per annum	9,129.0	6,921.0	4,679.0

ha = hectare, m³ = cubic meter.

Source: selection from *Ekologicheskaya Statistika*, Kazakhstan Statistical Office, 2001.

Note: About 85% of total withdrawals are from surface sources, the rest from groundwater sources. Proportionately, however, groundwater is much more important) in meeting drinking and industrial—rather than agricultural—needs (55% and about 50% of the total, respectively).

References in the text: para. 11.

Table 4: Kazakhstan: Quality of Surface Water in Principal Surface Water Bodies 1990–2000

Rivers/Lake	1990		Mid-1990s		2000	
	Composite Index of Pollution (IZV)	BOD5 (mg/l)	Composite Index of Pollution	BOD5 (mg/l)	Composite Index of Pollution	BOD5 (mg/l)
Ural	3.99	2.65	7.20	2.62	3.21	2.60
Irtys	7.31	2.43	6.60	1.77	4.04	1.88
Syrdarya	1.03	1.89	1.66	1.40	2.55	1.92
Nura	3.00	4.03	2.10	3.23	2.97	5.08
Illi	1.47	1.31	1.30	1.42	1.25	1.38
Ishim	0.98	1.90	1.20	1.84	0.99	1.97
Shu	0.016	3.30	1.30	2.94	0.81	3.18
Talas	0.27	6.54	1.25	2.52	0.76	2.93
Tobol	0.61	1.63	0.58	1.66	0.51	2.06
Balkhash Lake	4.76	1.64	5.20	1.63	4.68	1.13

Source: KAZHYDROMET, based on measurements by 212 stations in 1990 and 96 stations in 2000.

Notes: (i) IZV index has 7 bands of quality ranging from very clean (IZV<0.3) to extremely polluted (>10). Existing official upper BOD5 values for commercial and household-use (prior to treatment) and fisheries is 3.0mg/l. Individual control parameters other than BOD5 frequently exceed maximum permitted concentrations (e.g., phenol in the Ural, heavy metals and oil products in the Irtys, etc.).

(ii) IZV will tend to vary along the course of the river and during the course of the year a single result will hide these differences.

(iii) Many smaller tributaries of the principal rivers (e.g., the Ilek passing through Aktyubinsk, the Krasnoyarka flowing into the Irtys or the Kara-Kengir in Zhezkazgan city) show particular high values of IZV.

References in the text: paras. 12 and 15.

Table 5: Kazakhstan: Average Quality of Water By Location, 1996–2000

Kazakhstan and Oblasts	1996		2000	
	Chemical Properties (% of Tested Samples Not Meeting Existing Standards)	Microbiological Properties (% of Tested Samples Not Meeting Existing Standards)	Chemical Properties	Microbiological Properties
Kazakhstan	11.8	9.0	11.1	8.0
Akmola	8.9	1.0	19.2	5.8
Aktobe	29.2	37.9	17.6	58.4
Almaty	6.6	8.8	3.9	2.7
Atyrau	11.8	9.0	13.5	3.8
East Kazakhstan	25.3	8.3	9.5	9.9
Zhambyl	0.6	6.5	2.5	4.2
West Kazakhstan	13.2	13.7	11.5	2.7
Karaganda	6.9	7.8	29.2	5.0
Kostanai	29.4	6.6	13.6	15.9
Kyzylorda	64.6	100.0	18.9	18.7
Mangistau	5.6	8.4	0.0	0.4
Pavlodar	3.8	14.4	1.8	4.5
North Kazakhstan	1.4	5.6	4.2	10.7
South Kazakhstan	2.6	7.0	5.0	5.6
Astana City	n.a.	n.a.	16.0	5.6
Almaty City	0.0	74.7	1.8	41.0

Source: Sanitary and Epidemiology Service of the Republic of Kazakhstan.

References in the text: paras. 13 and 15.

C. Air Pollution and Air Quality

Table 6: Kazakhstan: Overall Pattern of Air Emissions, 1990–2000

Item	Unit	1990	Mid-1990s	2000
All Air Pollution Discharges From Stationary Sources	'000 tons	4,677.000	3,097.000	2,429.0
Per Unit Of Real GDP	1990=100	100.000	108.000	75.0
Karaganda Oblast	% of total	36.000	35.000	46.0
Pavlodar Oblast		21.000	25.000	18.0
East Kaz. Oblast		7.000	7.000	10.0
All Air Pollution Discharges From Mobile Sources	'000 tons	2,610.000	997.000	1,098.0
Per Unit Of Real GDP	1990=100	100.000	62.000	61.0
All Discharges Of SO ₂	'000 tons	1,480.000	1,133.000	983.0*
Nox	'000 tons	730.000	353.000	159.0*
Part. Matter	'000 tons	1,500.000	1,029.000	687.0*
Co	'000 tons	2,158.000	1,262.000	360.0*
Lead	'000 tons	0.265	0.165	n.a.

* Figures for 1998.

Source: *Ekologicheskaya Statistika*, Kazakhstan Statistical Office, 2001; UN ECE (2000).

Notes: (i) In mid-1990s, the percentages in total emissions of individual waste streams attributable to stationary sources were close to 100% for SO₂ and dust, 68% for Nox, 39% for CO and 0% for lead.

(ii) In 1997, Kazakhstan per capita emissions as percentage of comparable OECD average were 112% for CO₂, 59.1% for Nox, and 186.9% for SO₂. (Source: OECD).

References in the text: para. 24.

Table 7: Kazakhstan: Spatial Variations in Air Pollution by Main Urban Areas, 1990–2002

Selected Urban Areas	Weighted Index of Atmospheric Pollution (IZA5)			Average SO ₂ Emissions (mg/m ³)		Average of Particulate Matter (mg/m ³)	
	1990	2000	2002	1990	2000	1990	2000
Aktau	9.1	4.6	4.8	0.062	0.028	0.4	0.4
Aktobe	7.5	10.0	9.5	0.039	0.027	0.1	0.01
Almaty	7.9	9.9	11.7	0.011	0.009	0.3	0.2
Astana	1.8	1.7	2.6	0.002	0.004	0.1	0.03
Atyrau	2.7	2.5	2.0	0.001	0.003	0.2	0.3
Balkhash	16.8	3.3	2.4	0.033	0.056	0.2	0.2
Zhezkazgan	6.7	7.5	6.8	0.019	0.010	0.3	0.7
Karaganda	7.5	4.6	6.5	0.009	0.004	0.1	0.1
Kostanai	3.2	2.9	3.4	0.017	0.030	0.1	0.1
Ridder (ex-Leninogorsk)	17.1	10.0	11.3	0.040	0.091	0.2	0.1
Pavlodar	2.5	2.3	1.5	0.006	0.005	0.1	0.1
Petropavlovsk	7.3	6.8	3.4	0.011	0.009	0.1	0.1
Semipalatinsk	9.5	4.0	2.6	0.014	0.015	0.4	0.1
Taraz	14.7	7.8	7.3	0.019	0.017	0.2	0.3
Temirtau	13.9	6.9	8.8	0.010	0.006	0.3	0.1
Uralsk	2.4	1.4	1.2	0.025	0.009	0.1	0.2
Ust-Kamenogorsk	21.8	17.8	16.0	0.090	0.172	0.2	0.01
Shymkent	13.9	10.0	9.5	0.014	0.006	0.4	0.2
Ekibastus	3.6	1.7	1.9	0.007	0.006	0.1	0.4

Source: KAZHYDROMET.

Notes: (i) As in the case of water quality, the concentration of air pollutants varies both in time and in space and this need to be borne in mind in interpreting annual IZA averages. The air is considered polluted for IZA values in excess of 5.

(ii) Kazakhstan's maximum permissible concentrations (MPC) for SO₂, NO₂ and particulate matter [0.05mg/cu m (24 hours) for SO₂, 0.04 mg/cu m (24 hours) for NO₂ and 0.05mg/cu m] are in general stricter than WHO- or EU-recommended values but less strict in the case of lead, for instance.

References in the text: para. 24.

D. Hazardous Waste Management

Table 8: Kazakhstan: Generation, Use and Disposal of Hazardous Waste, 1994–1998

Waste	Unit	Generated		Recycled		Treated		Transferred	
		1994	1998	1994	1998	1994	1998	1994	1998
Total Hazardous Waste	'000 tons	54,126	83,912	2,741	12,558	672	1,460	70,780	70,386
Solid Waste	'000 tons		77,086		12,495		839		64,275
Liquid	'000 tons		776		48		617		164
Sludges	'000 tons		6,050		15		4		5,947
Total Hazardous Waste By Selected Oblasts									
Almaty			1,216						
East Kazakhstan			31,298						
Karganda			36,019						
Pavlodar			5,087						
Transferred Stocks Meeting Environmental Standards	'000 tons							41,250	64,907
Stocks at Enterprises at End of Year	'000 tons							251,1000	2,964000

Sources: State Statistical Agency, UN ECE (2000).

Note: Comprehensive definition exists in Kazakhstan of what constitutes hazardous waste. Five main classes include (i) explosive and flammable substances, (ii) oxidizers, (iii) toxic substances, (iv) caustic and corrosive substances, and (v) substances releasing toxic products.

References in the text: para 22.

E. Ecosystems and Biodiversity Conservation

Table 9: Kazakhstan: Strict Nature Reserves, 2001

Nature Reserves ("Zapovedniki")	Oblast	Year Established	Area (000 ha)	Number of Species			
				Total	Plants	Animals	Birds
Aksu-Zhabagli	South Kazakhstan	1927	85	1,404	51	239	2
Alakol	Almaty	1998	21	323	40	283	16
Almaty	Almaty	1961	72	965	39	200	0
Barsa-Kelmes	Kyzylorda	1939	17	250	11	3	0
Western Altai	East Kazakhstan	1992	56	564	50	131	5
Kurgalzhina	Akmola	1968	259	343	41	315	14
Marakakol	East Kazakhstan	1976	75	721	58	260	5
Nauryzym	Kostanai	1934	88	687	42	286	6
Ustyurt	Mangistau	1984	223	261	27	111	n.a.
Total			896				

Source: Ekologicheskaya Statistika, 2001.

References in the text: para. 25.

Table 9: Kazakhstan: National Parks, 2002

National Park (Oblast)	Year Established	Area ('000s ha)				Number Of Species			
		Total	Forest	Meadows	Water Bodies	Plants	Animals	Birds	Fish
Altyn-Emel (Almaty)	1966	209	12	11	32.0	1,800	8	231	23
Bayanulsk (Pavlodar)	1985	51	18	13	1.0	438	40	54	8
Ile-Alatau (Almaty)	1996	202	62	63	0.3	1,282	43	138	8
Kakarlinsky (Karaganda)	1998	90	40	n.a.	0.1	68	39	55	11
Kokshetau (Akmola)	1996	136	112	8	12.0	800	306	223	22
Total		688	244	94	45.0				

Sources: State Statistical Agency, UN ECE (2000).

Note: In addition to nature reserves ("zapovedniki") and national parks, both categories strictly protected, other types of areas are given partial protection through limits on allowable activities in all of FSU countries. They include local-level special reserve zones ("zakazniki") -e.g. the the North Caspian Region Reserve Zone including the Volga and Ural deltas-- and wildlife sanctuaries ("zakazniki"). Zapovedniki broadly correspond to IUCN category I and national parks to IUCN category II protected areas.

References in the text: para. 25.

DONOR ENVIRONMENTAL ASSISTANCE TO KAZAKHSTAN

Technical or Thematic Area of Assistance	Project Titles ^a and Activities (ADB assistance not included, shaded activities target more than a single CAR)	Source of Financial or Technical Support	Amount (in \$ million unless otherwise stated)
Institutional support for mainstreaming sustainable development	<p>Implementation of National Strategy - Environment and Natural Resources 1998–2000</p> <p>Institutional Strengthening for Sustainable Development (2000–2004)</p> <p>Activities: Proposals for overcoming inter-sectoral barriers, assessment of cross-sectoral mechanisms to implement Kazakhstan's commitments to Agenda 21; Concept paper for Kazakhstan Agenda 21: Identification and formulation of structures and priorities for the National Agenda 21; Integration of Kazakhstan Agenda 21 with the Regional Agenda 21 CAR countries (in progress); Proposals for the structure and functions of the National Commission for Sustainable Development (in progress)</p> <p>National Environmental Strategies for Sustainable Development (under preparation); to support a widening of the scope of NEAPs to include sustainable development and poverty reduction issues</p> <p>Regional Capacity 21 to improve regional coordination on SD in Central Asia through enhanced capacity of regional stakeholders</p>	<p>UNDP</p> <p>UNDP</p> <p>EU/TACIS</p> <p>UNDP/EU TACIS</p>	<p>n.a.</p> <p>1.1</p> <p>E1.8</p> <p>0.4</p>
Overall environmental management	<p>Institutional Strengthening for Sustainable Development (see above)</p> <p>Activities: Identification of principal problems of environmental legislation and policy and management and proposals to improve efficiency of environmental management; Analysis of restructuring possibilities for (then) MNREP and submission of proposals to the Government; Coordination of environmental projects funded by GEF</p>	UNDP	See above
Information, monitoring	<p>National Basic Geographic Data on Land use, Registration and Cadastres</p> <p>Support to National State of the Environment (SoE) Report</p>	<p>JICA</p> <p>UNEP/GRID Arendal</p>	<p>n.a.</p> <p>0.15</p>
Disaster preparedness	<p>Improvement of Earthquake Monitoring in Almaty</p> <p>Building for Disaster Preparedness; to design Kazakhstan Natural Disaster Preparedness Plan</p>	<p>JICA</p> <p>UNDP</p>	<p>n.a.</p> <p>0.05</p>
Support for implementing international environmental conventions	<p>Institutional Strengthening for Sustainable Development (see above): Review of conventions and responsibilities, identification of barriers to implementation, and effective response mechanisms, review of relevant experience in</p>	UNDP	See above

Technical or Thematic Area of Assistance	Project Titles^a and Activities (ADB assistance not included, shaded activities target more than a single CAR)	Source of Financial or Technical Support	Amount (in \$ million unless otherwise stated)
	other countries, analysis of legislative provisions relating to the conventions. Reports and recommendations to Government, training courses for Environmental Committee personnel.		
Fostering regional cooperation in environmental matters	Institutional Strengthening for Sustainable Development (see above) Mechanism of developing and monitoring national components of regional projects; Development of the national component for REAP Support of the Central Asia Regional Environmental Center Activities	UNDP EU TACIS	n.a. 3.0
Addressing the Aral Sea environmental problems	Aral Sea Program Phase I , 1994– Water and Environmental Management in the Aral Sea Basin (WEMP) to develop short - and long-term development scenarios of the Aral Sea Basin, to change the approaches to regional water management, transboundary monitoring, water conservation by consumers and other activities (2000–) Aral Sea Ashore Rehabilitation and Capacity Building , 1995–1999 Aral Sea Basin Capacity Development Project : to strengthen EC IFAS in planning activities, to support regional sustainable development, 1998–2001 Rehabilitation of the Water Distribution Networks in Two Most Affected District Areas of Aral Sea (1997–) also listed as Drinking Water Improvements, selected improvement of the system in and around Aralask, 1995–1997 Aral Sea Region Development and Humanitarian Assistance (1998–2002); emphasis in water management, small business promotion Capacity Building of Water Users for Sustainable Development in the Aral Sea Basin Environmental Policy and Technology Project (EPT) : Improved water supply for affected regions of the Aral Sea Disaster Area in Kazakhstan, Uzbekistan and Turkmenistan. Assessment of	WB/UNDP/ UNDP/GEF GEF/ Neth./ Sweden/ EU WB-implem. WB/Kuwait Fund/GTZ UNDP UNDP/Neth. UNDP/World Bank UNDP UNDP USAID USAID/	41.0 n.a. n.a. 1.7 15.2 n.a. n.a. 22.3 4.7

Technical or Thematic Area of Assistance	Project Titles ^a and Activities (ADB assistance not included, shaded activities target more than a single CAR)	Source of Financial or Technical Support	Amount (in \$ million unless otherwise stated)
	water management's impact on the Syr Daryas tributaries, other studies of the environmental repercussions of the changing Aral sea level, tariff setting, assessment of water supply in Aralsk and Novokazalinsk, river water allocation modeling, transboundary issues, 1993-96	OSCE	
	Environmental Policies and Institutions for Central Asia (EPIC) Information networking in Central Asia, national improvements in water management, transboundary dialogue and interstate agreements negotiation, climate change, energy and other issues Second phase of USAID Central Asia environmental initiative	USAID	n.a.
	Natural Resources Management Program (NRMP) Pilot projects to demonstrate improved water and energy management; support to Regional Water Resources Training Center, improved hydrological information gathering and networking in Central Asia, transboundary dialogue and interstate agreements negotiations (WEMP subproject)	UNICEF	n.a.
	Aral Sea Project for Environmental and Regional Assistance water and sanitation components	World Bank	64.5
	Syr Darya Control & Northern Aral Sea Phase I: Infrastructural interventions to increase the winter inflow into the Aral	UNESCO	n.a.
	Scientific Advisory Support for the Development of the Aral Sea Technical vision for its rehabilitation and improvement; monitoring equipment. Included <i>CA Vision for World Water Forum (2000)</i>	EU TACIS	E2.4
	WARMAP Program in the Aral Sea Region development of draft agreements on the shared use of the resources; WARMIS and water use farm management surveys subcomponents; Phases I and II completed. (Phase II mostly in Uzbekistan).	GTZ	n.a.
	Direct support for the planting of grass on the shores region of the Aral Sea to reduce dust storms	Swiss	n.a.
		CIDA	1.7
		UNDP/US Dept. of State	0.35

Technical or Thematic Area of Assistance	Project Titles^a and Activities (ADB assistance not included, shaded activities target more than a single CAR)	Source of Financial or Technical Support	Amount (in \$ million unless otherwise stated)
	<p>Hydro Meteorological Services for the Aral Sea Basin Program 1994–</p> <p>Water Resources Regional Training Centre to increase the capacity of local professionals to equip them for dealing with the problems of the Aral sea</p> <p>Snow-melting forecasts NOAA-assisted development of methodology, testing</p>		
Caspian Environmental Program	<p>Caspian Sea Environmental Program, 1998–Kazakhstan hosts one of the five Regional Thematic Centers (water fluctuations) sometimes as <i>Addressing Transboundary Environmental Issues in the Caspian Environmental Program</i>, Phase I and II</p> <p>Caspian Regional Development Program : development of SME in the face of environmental pressures</p>	EU TACIS/UNEP //GEF/World Bank/UNDP UNDP/UNV	18.3 mil n.a.
Management of water resources	<p>Irrigation and Drainage Improvement</p> <p>Atyrau Pilot Water Supply and Sanitation: Improvements through strengthening of local Vodokanal, infrastructure rehabilitation and institutional reforms</p> <p>Rehabilitation of the Water Distribution Networks in Two Most Affected District Areas of Aral Sea (see above)</p> <p>Environmental Management and Rehabilitation - cleanup of toxic wastes especially mercury in the Nura river, pollution control, 2001–</p> <p>Study Program for the Improvement of the Irtysh River Basin in Kazakhstan, 1999–2000</p> <p>Transboundary Management of the Irtysh River Basin, development of a basin integrated information system, hydrological modeling, formulation of a follow up policies, attempts to bring PRC within the framework, 2001–</p> <p>Water Management in the Nura-Ishim River Basin: Economic and financial analysis of alternative water supply option for Astana, costed plan for the clean up of the Nura river, strengthened management capacity, support for the preparation of new Water Code, 2002–2004</p> <p>Environmental Policy and Technology Project</p>	<p>World Bank</p> <p>World Bank</p> <p>WB/Kuwait Fund/GTZ</p> <p>World Bank</p> <p>French Fund for Global Environment</p> <p>French Fund for Global Environment</p> <p>DFID</p> <p>USAID</p> <p>USAID</p> <p>USAID</p>	<p>80.0</p> <p>16.5</p> <p>n.a.</p> <p>41.6</p> <p>n.a</p> <p>1.2</p> <p>1.3</p>

Technical or Thematic Area of Assistance	Project Titles ^a and Activities (ADB assistance not included, shaded activities target more than a single CAR)	Source of Financial or Technical Support	Amount (in \$ million unless otherwise stated)
	<p>(see above)</p> <p>Environmental Policies and Institutions for Central Asia (see above)</p> <p>Natural Resource Management Program (see above)</p> <p><i>Water Projects in Talas-Chu River Basins</i></p> <p>Reduction in Drinking Water Consumption and Reduction of Losses in Almaty sometimes as <i>Environmental Protection through Water Resource Management in Almaty</i>. Improved regulations, standards, water usage monitoring and control, training, 1996-2002</p> <p>Consolidation of the Results Results of the Water Resource Project in Almaty, 2002–2003</p> <p>Water Supply and Sanitation Project Karaganda, Temirtau improvement of water supply in Karaganda and Temirtau. Demand management</p> <p><i>Astana Water Supply</i>: part-privatization of water supply under municipal authorities</p> <p><i>Almaty Water Supply</i>: part-privatization of water supply under municipal authorities</p> <p>Development of Integrated Management Plan for Lake Balkhash-Ili Basin (under preparation)</p> <p>SPECA: Rational and Efficient Use of Energy and Water in Central Asia</p> <p>Integrated Water Resource Management in the Fergana Valley, 2003–</p>	<p>OSCE, UN SPECA</p> <p>GTZ</p> <p>GTZ</p> <p>World Bank</p> <p>EBRD</p> <p>EBRD/France</p> <p>EU/TACIS</p> <p>UN ECE/ ESCAP</p> <p>Swiss</p>	<p>n.a.</p> <p>1.2 mil</p> <p>0.15</p> <p>n.a.</p> <p>under prep.</p> <p>under prep.</p> <p>E0.7</p> <p>1.7</p> <p>15.0</p>
Groundwater protection	<p><i>Ust-Kamenogorsk Groundwater Contamination Cleanup</i> (1998–1999)</p> <p><i>Pavlodar Groundwater Contamination Clean-up</i> (mercury decontamination, project identified in the course of preparation of the French-funded Irtysh basin project –see below—to be financed by a soft loan; at present on hold)</p> <p>Uzen Oil Field Rehabilitation Project: a component to remediate past environmental damage and improve environment protection capability of Uzenmunaigas</p>	<p>GTZ</p> <p>French</p> <p>World Bank</p>	<p>n.a.</p> <p>n.a.</p> <p>109.0</p>
Air quality management	<p>Almaty Air Quality Program, Study of baseline conditions, motor fule issues, public health repercussions, 2001–2003</p>	<p>EU-TACIS</p> <p>EU-TACIS</p>	<p>1.4 mil</p> <p>0.9</p>

Technical or Thematic Area of Assistance	Project Titles ^a and Activities (ADB assistance not included, shaded activities target more than a single CAR)	Source of Financial or Technical Support	Amount (in \$ million unless otherwise stated)
	Atmospheric Pathways and Monitoring Systems for Ukrainian and Kazakh Sites , assessment of equipment needs, training in equipment use, procurement issues, 2001–2002		
Climate change	<p>Greenhouse Gas Emissions Reduction Initiative, (GGERI), a component of EPIC Program (see above) Establishment of national focal point office, CDM/JI registry and database, and associated policies and policy analysis, training, establishment of the Climate Change Center</p> <p>Caspian Basin Greenhouse Gas Emission Reduction Program, 2000–2004, identification of projects suitable for financing under Koyto Protocol mechanisms; regional scope</p> <p>South Europe and Central Asia Climate Change Support Fund; to support initiatives to combat climate change, core capacity building, financing project promoting carbon sequestration, etc. 1995-</p> <p>Country Program for Phasing Out of Ozone Depleting Substances, 2001–2004: to meet obligations under the Montreal Protocol, to support phasing out of selected CFCs, halon management</p>	USAID CIDA DFID, CIDA UNDP	2.0 4.0 2.0 5.6
Energy efficiency, renewable energy	<p>Removing Barriers to Wind Power Production in Kazakhstan</p> <p>Removing Barriers to Increased Hot Water and Heat Supply in Kazakhstan</p> <p>Energy Efficiency Demonstration Project in Atyrau energy conservation in buildings through metering (component of EPIC Program –see above)</p> <p>SPECA: Rational and Efficient Use of Energy and Water in Central Asia (see above)</p>	GEF PDFB grant GEF PDFB grant USAID UN ECE/ESCAP	n.a. n.a. 0.3 1.7
Clean production	Support to Ecolink: Cleaner production small grants program	USAID	n.a.
Land degradation, deswertification	<p>Support to the National Program (NAP) to Combat Desertification: forum, support to NGOs and CBOs to participate in national program, pilot management of pastoral ecosystems, 1998-2002</p> <p>Sustainable Land Use Strategy in Semipalatinsk</p>	UNDP DFID GTZ	0.09 n.a. n.a.

Technical or Thematic Area of Assistance	Project Titles ^a and Activities (ADB assistance not included, shaded activities target more than a single CAR)	Source of Financial or Technical Support	Amount (in \$ million unless otherwise stated)
	<p><i>-Direct support for the planting of grass on the shores region of the Aral Sea to reduce dust storms</i> (see above)</p> <p>Drylands Management Project: to convert marginal cereal growing land into managed conservation areas, promote carbon sequestration</p> <p>Initial Assistance to ROK to Meet its Obligations under Stockholm Convention on POPs; development of POP Implementation Plan, capacity building, information dissemination, 2002–2004</p>	<p>WB/GEF</p> <p>UNDP</p>	<p>25.0</p> <p>0.5</p>
Waste management	<p>Waste reduction project for Almaty <i>Rehabilitation of Old Neglected Deposits in Ust_Kamenogorsk;</i> feasibility study of re-processing old waste, 2000 (follow up on another CTZ project listed above, i.e., Ust Kamenogorsk Groundwater Contamination Cleanup)</p>	<p>JICA</p> <p>GTZ</p>	<p>n.a.</p> <p>0.2</p>
Land contamination	<p><i>Zoning for radioactively contaminated lands in Semipalatinsk and Aktau regions</i></p>	<p>OSCE</p>	<p>n.a.</p>
Ecosystem protection	<p>Development and Conservation of the Mountain Eco system of the Tian Shan Mountain Ranges also as <i>Biodiversity in the West Tian Shan Mountain Region</i></p> <p>Central Asian Mountain Partnership Program (CAMP)</p> <p>Complex Solution of Wetlands Rehabilitation Problem in the Aral Sea basin sometimes as <i>Remote methods of assessing problems of desertification and ecological crises prevention.</i> ICWC-implemented</p>	<p>GEF</p> <p>Swiss</p> <p>NATO</p>	<p>n.a.</p> <p>n.a.</p> <p>n.a.</p>
Biodiversity conservation	<p>Assistance to GOK in the Development of a Strategy to Implement the Convention on Biodiversity, 1997–2002</p> <p>Integrated Conservation of Priority Globally Significant Migratory Bird Habitat; PDF B study development for GEF funding</p> <p>Assessment of Capacity Building Needs and Enhancement of the Biodiversity Information Management</p> <p><i>Wetlands of Ural delta, Tengiz-Kurgadzino system of lakes, Alakol lakes and Syr Darya delta</i></p> <p>Central Asia Biodiversity Conservation (sometimes as <i>Central Asia Transboundary Biodiversity Project</i>): management plans and investment program for four protected areas in West Tian Shan, incl. one in Kazakhstan</p>	<p>UNDP</p> <p>UNDP/GEF</p> <p>GEF</p> <p>GEF</p> <p>WB/GEF/ EU TACIS</p> <p>UNDP/GEF</p>	<p>0.15</p> <p>8.8</p> <p>0.175</p> <p>n.a.</p> <p>14.0</p> <p>3.0</p>

Technical or Thematic Area of Assistance	Project Titles^a and Activities (ADB assistance not included, shaded activities target more than a single CAR)	Source of Financial or Technical Support	Amount (in \$ million unless otherwise stated)
	In-situ Conservation of Kazakhstan's Mountain Agrobiodiversity (Zailiyski Alatau and Dzungar Alatau regions), 1997-2002		
Multi-component	<p>GEF Small Grants Program: (biodiversity conservation, climate change, protection of int. waters through community-based approaches, usually to re-inforce other projects, 1997</p> <p>National Capacity Self-Assessment for Global Environmental Management</p> <p>Environmental Policies and Institutions for Central Asia (EPIC) (see above)</p> <p>Natural Resource Management in Central Asia (NRMP) (see above), policy development and training in integrated natural resource management, best practice in contamination cleanups, energy-saving technologies, irrigation best practices, and more</p> <p>Central Asia Mountain Program (CAMP) various activities to improve livelihoods and protect mountain environments</p> <p>SPECA: Rational and Efficient Use of Energy and Water in Central Asia (see above)</p>	<p>UNDP/GEF.</p> <p>GEF</p> <p>USAID</p> <p>USAID</p> <p>Swiss</p> <p>UN ECE/ESCAP</p>	<p>0.9</p> <p>0.2</p> <p>n.a.</p> <p>n.a.</p> <p>n.a.</p> <p>1.7</p>
Public participation	<p>Raising Awareness of the Aarhus Convention in the East Kazakhstan Region</p> <p>Monitoring Indicators for the Implementation of the Aarhus Convention in Kazakhstan</p>	<p>OSCE</p> <p>OSCE</p>	<p>Small</p> <p>0.02</p>

^a Often, conflicting titles of projects are used. Bold script is used where the formal title (or its close substitute) was available. Italics are used where exact title was unavailable.

^b The table does not include all regional projects, only those in which Kazakhstan plays a sufficiently prominent role. For instance the Swiss-funded Regional Centre on Hydrology, despite its regional moniker, is considered too Uzbekistan-oriented to be separately included here.

^c The table does not in all cases include all cofinancing partners. Many different governments and agencies contribute to larger projects and play an important catalytic role. Neither does the table capture NGO activities, some financed by the NGO themselves (e.g., *Medicins sans Frontieres*).

ADB MULTI-YEAR ASSISTANCE PROGRAM TO KAZAKHSTAN

A. Loans (in \$ million)

Number	Title	Year Approved	Loan Amount
1338	Special Assistance	1994	40.0
1406	Agriculture Sector Program	1995	100.0
1455	Road Rehabilitation	1966	50.0
1541/1542	Basic Education	1997	35.0
1589	Pension Reform Program	1997	100.0
1592/1593	Water Resource Management and Land Improvement	1997	30.0
1774	Almaty–Bishkek Regional Road Rehabilitation	2000	65.0
1779/1780	Farm Restructuring Sector Development Program	2000	45.0
	Second Education	2001	
Under Preparation			
	Rural Water Supply and Sanitation Sector	2003	
	Borovoe-Kokshetau-Petropavlosk Road Rehabilitation	2004	
	Rural Area Development Project	2004	
	Third Education Project	2005	
	Second Water Resources Management and Land Improvement Project	2005	
	Second Rural Water Supply and Sanitation Sector	2006	
Regional			
	Central Asia Gas Transmission Modernization, Phase I (UZB/KAZ/KGZ/TAJ)		

B. Technical Assistance (in \$'000s)¹

Type, TA Number	Year	Title	TA Amount
PP, 2261	1994	Almaty Air Quality Study	100
PP, 2285	1995	Preparation of a Road Rehabilitation Program	600
PP, 2313	1995	Industry and Enterprise Sector Reform	600
AO, 2356	1995	Strengthening of the Implementation of Agriculture Sector Program	600
PP, 2366	1995	Rehabilitation and Environmental Improvement of the Almaty No.1 Heat and Power Station	556
AO, 2448	1995	Study on Market Reform in the Agriculture Sector	1,044
AO, 2631	1996	Institutional Strengthening of the Road Sector	750
PP, 2632	1996	Feasibility Study of Selected Priority Road Sections	750
PP, 2677	1996	Water Resource Management and Land Improvement	100
PP, 2737	1996	Farm Restructuring and Development	1,200
AO, 2946	1997	Institutional Development and Policy Reforms for Improving Water Management	600
AO, 3350	1999	Strengthening Environmental Management	700
PP, 3442	2000	Preparation of the Locust Management Project	100
AO, 3451	2000	Deepening of Agricultural Reforms and Development Program	800
AO, 3530	2000	Improving of the Road Sector Efficiency	750

¹ Of the more than 50 TA projects implemented since 1994, only the TA most relevant to the subject matter of this CEA are listed

Type, TA Number	Year	Title	TA Amount
AO, 3550	2000	A Comprehensive Medium-Term Poverty Reduction Strategy	830
PP, 3572	2000	Rural Water Supply	600
PP, 3633	2001	Urban Small Business Development	600
AO, 3881	2002	Forum on the Implementation of the Kazakhstan Strategy up to 2010	150
AO, 3898	2002	Participatory Rural Sector Planning and Development	150
AO, 3939	2002	Education Sector Development Strategy	600
PP, 3964	2002	Borovoe-Petropavlovsk Road Rehabilitation	150
AO, 3988	2002	Social Sector Expenditure Review	150
AO, 4027	2002	Industrial Sector Review and Strategy	150
AO, 4072	2002	Capacity Building of National and Local Government to Implement the Poverty Reduction Program	676
AO,	2003	Monitoring Kazakhstan's Poverty Reduction Program	
Under Preparation			
AO	2004	Improved Environmental and Natural Resource Management	
AO	2004	Institutional and Technological Strengthening for the Second Water Resources Management and Land Improvement	
AO	2004	Capacity Building in the Transport Sector	
PP	2004	Second Water Resources Management and Land Improvement	
AO	2005	Capacity Building for Policy Coordination and Strategic Planning Phase II	
AO	2006	Supporting Shift to Local Self-Government	
AO	2006	Capacity Building for Fiscal Management at the Local Level	
AO	2006	Institutional Strengthening for Rural Water Supply and Sanitation Sector	
Regional			
5860	1999	Institutional Strengthening and Collection of Environmental Statistics	500
5878	1999	Regional Cooperation for Sustainable Mountain Development in Central Asia	380
5934	2000	Regional Environmental Action Plan (REAP) in Central Asia	500
5941	2000	Combating Desertification in Asia	450
5972	2001	Promotion of Renewable Energy, Energy Efficiency and GHG Abatement Projects (PREGA)	5,000
5996	2001	Ten Years After Rio: Promoting Subregional Cooperation for Sustainable Development	200
6001	2001	Regional Consultations for the Third World Forum	1,000
Under Preparation			
Regional Private Sector Development			
Regional Tourism Development (KAZ/KGZ/TAJ/UZB)			
Support for Greater Silk Road Initiative 2004–2005 (AZE/PRC/KAZ/KGZ/MON/TAJ/UZB)			