ADB

COUNTRY ENVIRONMENTAL ANALYSIS

AZERBAIJAN



Asian Development Bank

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ADB analysis to provide background information for informed decision making on environmental issues that are most important for development

1. Asian Development Bank.
2. Environmental management.
3. Azerbaijan.

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Contents

Abbreviations v
Glossary v
Preface vii
Executive Summary ix
Introduction 1
Background 3

A. Hydrocarbons, Economic Development, and the Environment in the Southern Caucasus 3
B. Poverty and Environment 3
C. Structural Features of the Azeri Economy and Their Environmental Dimensions 4
D. Land Use and Land Reform 8

Main Groups of Environmental Concerns and Issues 10

A. Pollution from Industrial and Energy Production, Transport, and Other Sources 11
B. Water and Wastewater Management 16
C. Land and its Degradation 19
D. Vulnerability to Natural Risks and Disaster Management 22
E. Threats to Protected Areas and Elements of Ecosystems 24
F. Safeguarding Cultural Heritage 26
G. Regional Environmental Concerns 26

Institutional and Policy Framework in Azerbaijan's Environmental Management 29

A. Legislative and Regulatory Development 29
B. Environmental Policies and Their Evolution 32
C. Institutional Responsibilities 36
D. Environmental Standards and Environmental Impact Assessment Process 40
E. Environmental Monitoring 42
F. Financing Environmental Management 42

G. Azerbaijan and International Environmental Agreements 44
H. Role of Civil Society 44
I. Development Partner Assistance and Search for Greater Synergy 46

Recommendations for the Asian Development Bank's Approach and Program 48

A. Environmental management in Azerbaijan Asian Development Bank's and Others' Experience 48
B. Asian Development Bank's Environmental Strategy in Azerbaijan 49

1. Building Blocks 49
2. Selectivity 50
3. Programming Recommendations 54

C. Regional Considerations 60
D. Conclusions and Recommendations 61

Appendixes 73

Appendix 1 : National Environmental Action Plan Priority Environmental Actions 74
Appendix 2 : Strategic Government Environmental Priorities after 2000 83
Appendix 3 : Selected Country Environmental Indicators 85
Appendix 4 : Selected Environmental Statistics of Azerbaijan 87
Appendix 5 : Principal Environmental Laws of Azerbaijan 91
Appendix 6 : Nature Reserves and Conservation Areas of Azerbaijan 92
Appendix 7 : Azerbaijan's Participation in International Environmental Agreements 95
Appendix 8 : Asian Development Bank Assistance for Environment mental Management in Azerbaijan (2001–2004) 96
Appendix 9 : Development Partner Assistance to Environmental Management in Azerbaijan 97
Appendix 10 : Country Environmental Analysis Consultation Process 109

References 112

Abbreviations

ADB	–	Asian Development Bank
AZECOLAB	–	Azerbaijanskaja Ecologicheskaja Laboratorija
BTC	–	Baku-Tbilisi-Ceyhan (pipeline)
EU TACIS	–	European Union Technical Assistance to Commonwealth of Independent States
FSU	–	former Soviet Union
IDP	–	internally displaced person
MENR	–	Ministry of Environment and Natural Resources
NEAP	–	National Environmental Action Plan
NEHAP	–	National Environmental Health Action Plan
SCLII	–	State Committee for Land Improvement and Irrigation
SPESSED	–	State Program for Environmentally Sustainable Economic Development
SPPRED	–	State Program on Poverty Reduction and Economic Development
SPSEDR	–	State Program for Socio-Economic Development of Regions
UNECE	–	United Nations Economic Commission for Europe
UNEP	–	United Nations Environment Program

Glossary

anadromous (fish)	–	dependent on river freshwater for breeding
Bakkanalizatsiya	–	Baku Canal and Wastewater Services
Hydromet	–	state hydrometeorological service
ichtiofauna	–	ecological term meaning fish
kahriz	–	traditional system of subterranean water conveyance originating in Persia
kolkhoz	–	collective farm (during Soviet days)
kolmatazh	–	mechanical removal of larger stones from the alluvium and control of the land's porosity
priusadok	–	household garden plot
sovkhoz	–	state farm (during Soviet days)
vodokanal	–	municipal water service company

Notes

(i) In this document, the broader "environmental" is used instead of "ecological" (a common mistranslation from Russian into English), keeping the word "ecological" only where its technical meaning is not compromised.

(ii) Both "Aras" and "Araks" are used in the literature to describe the tributary of the Kura River. Here the former version is used.

(iii) Several action and strategic documents of the Government are sometimes referred to as *state* programs sometimes as *national* programs. Unless a particular usage has become widely accepted (e.g., in the National Environmental Action Plan or the National Environmental Health Action Plan), this document uses the former label.

(iv) Inconsistent English names of certain government bodies abound in the documentation. This is particularly true for state committees dealing with irrigation and drainage and land use and mapping. The text makes it clear which versions are favored here.

(v) In this report, "$" refers to US dollars.

Currency Equivalents
(as of April 2005)

Currency Unit	–	Azerbaijan Manat
AZM 1.00	=	0.00002077706
$1.00	=	AZM4,813

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.

ADB member countries under the responsibility of the East and Central Asia Department (ECRD) include transition economies, six of which are countries of the former Soviet Union. This provides unique opportunities for ADB to contribute to the ongoing economic and social change in these fledgling market economies.

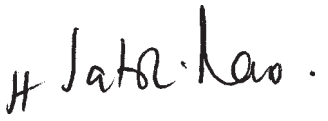
ADB's support for environmental management in ECRD's geographical area of responsibility is not new. Earlier ADB publications devoted to the same broad subject include *Central Asian Environments in Transition* (1997); *Environmental Profile of Tajikistan* (2001); *Mongolia's Environment and the Implications for ADB Operations* (2002); a series of country environmental analyses prepared for Kazakhstan, Kyrgyz Republic, Tajikistan, and Uzbekistan in 2004–2005. These analyses complement a considerable body of detailed unpublished material that ADB staff members use.

This document is one of the outputs of Regional Technical Assistance 6095: Integrating Environmental Concerns in Government Policies, Plans, and Programs, and is based on the work of Ivan Ruzicka, an ADB consultant. It incorporates a number of comments made by ADB staff members during the document's preparation.

This document builds on the analysis and recommendations of the comprehensive *Azerbaijan Urban Profile* (2005).

ADB thanks Azerbaijan's Ministry of Environment and Natural Resources for facilitating the report's preparation and the State Committee for Land and Mapping for generously sharing its experience of land management in field locations. Technical staff of both organizations contributed substantially to preparing the report besides helping ADB understand the local context. Discussions with the State Committee for Land Improvement and Irrigation and Ministry of Health added to that understanding. ADB had the benefit of insights of its development partners

in Azerbaijan, especially the World Bank, United Nations Development Programme, European Bank for Reconstruction and Development, European Union–Tacis, US Agency for International Development, and Deutsche Gesselschaft für Technische Zusammenarbeit (GTZ). The World Bank-sponsored Caspian Environment Program Investment and Donors Forum provided an excellent opportunity to discuss some of the ideas contained in this report with representatives of the donor community. Valuable inputs were received by Azerbaijan-based nongovernment organizations (NGOs), especially Adventist Development and Relief Agency International, Mercy Corps, and World Wildlife Fund. The Regional Environment Center for the Caucasus helped organize a productive meeting with local NGOs. The views expressed in this book are those of the authors and do not necessarily reflect the views and policies of the Asian Development Bank or its Board of Governors or the governments they represent.



Satish Rao
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Executive Summary

Environmental Priorities and Issues

Environmental concerns in Azerbaijan have been summarized on numerous occasions. The National Environmental Action Plan (NEAP) of 1997 remains influential. More recent strategic documents (the 2001 State Program on Poverty Reduction and Economic Development [SPPRED] and the 2003 State Program for Environmentally Sustainable Economic Development) restate and add to environmental priorities without, however, suggesting the order in which they should be supported by public investments. A ranking strictly based on economic efficiency criteria is unlikely to emerge. More probable is a politically determined balance of attention to different broad concerns (not unlike the case of the NEAP) only then followed by economics-supported prioritization within each broad category. Government environmental priorities are examined in Appendix 2.

Without strict ordering, the prioritization is as follows.

Past and Current Pollution from Industrial Sources. The industrial base created in Azerbaijan to process Caspian oil for the needs of the Soviet Union became vastly inappropriate once Soviet-era industry supply arrangements collapsed. The ensuing reduction of industrial discharges improved ambient air quality in the Baku-Sumgayit area (once among the worst in the Soviet Union) but left the problem of massive old contamination unresolved. As it is, the Absheron Peninsula in particular (including the coastal areas) suffers from oil, mercury, and other types of chemical contamination. The problem of abandoned industrial facilities, with their old waste, is found in many other places in Azerbaijan, but not on the same scale. The remedial activities have been on a pilot scale, so far, and have not fundamentally changed the situation. By contrast, the environmental performance of the oil extraction sector has improved with the inflow of direct investment from Organisation for Economic Co-operation and Development countries.

Solid Waste Management. Management of solid waste is poor in most urban centers, with smaller towns performing worse than Baku or not performing at all. Unsafe landfills and uncertain separation of hazardous from nonhazardous waste are the key problems, and minimum waste recycling a subsidiary one.

Energy Inefficiency and Industrial Air Pollution. Like other energy exporting former Soviet Union (FSU) countries, Azerbaijan uses its energy rather inefficiently. Flaring off natural gas, using heavy oil for electricity generation, and general inefficiency of energy-using equipment are among the principal factors. If air pollution has dropped significantly in Azerbaijan since 1991, industrial contraction (rather than improved plant-level efficiency or effective enforcement of environmental regulations) is mainly responsible. Needed is encouragement of clean production practices and new regulatory approaches.

Power Supply and Deforestation. The disruption or outright disappearance of power supply to many towns and settlements in the post-1991 period has been an indirect cause of deforestation and forest degradation in Azerbaijan, as the affected communities turned to fuelwood. There is scope for renewable energy development beyond the four hydroelectric power stations now operating. More than in high-income countries, the structure of fuel taxation in Azerbaijan has far-reaching environmental repercussions.

Mobile Source Pollution. A significant shift in the pattern of air pollution has occurred in Baku, where vehicles now outstrip industry as the principal source of air discharges. The problem is exacerbated by traffic congestion and safety concerns.

Water and Wastewater Management. Azerbaijan is disproportionately dependent on polluted transboundary rivers (Aras, Kura, and Samur) for its domestic needs. The eastern part of the Kura-Aras plain is an extensively irrigated water deficit area. The disruption of irrigation system maintenance has worsened the build-up of salinity that now affects more than one third of all irrigated lands. Agriculture continues to be the main user of water but continues to use it inefficiently.

The overall balance of wastewater discharges in Azerbaijan has changed significantly since independence. Reduction of industrial wastewater discharges accompanying the contraction of industrial output has been offset by lowered treatment of municipal discharges. Only 16 out of the most

important 75 towns have wastewater treatment facilities and most of the 16 work only partially.

Piped drinking water is provided to 50–95% of the urban population, depending on the urban center. Once water quality is taken into account, the effective provision of safe drinking water falls below 50%. Large imbalance in water use (and wastewater discharges) exists between the main cities (Baku in particular) and the rest of the country, and systems losses are high across the board. With surface water in poor shape, greater use of the country's groundwater resources is seen as a necessity.

Land Degradation. Very low agricultural productivity in Azerbaijan and the loss of Nagorno-Karabakh adds to a sense of land shortage in Azerbaijan. The dismantling of collective farming has had far-reaching repercussions for cropping patterns, as have the use of pasturelands and the pattern of maintenance of previously common infrastructure (irrigation, power, supply, and others). Overall, these changes have safeguarded livelihoods but worsened land use (in particular the vulnerability to soil erosion), especially in hilly areas where perennial crops have been replaced by annual crops. At the same time, Azerbaijan's land reform is more advanced than in any other FSU country. Former pasture- and forestlands have not been touched by the reform, however, and some of the environmental problems related to land use are found there. Changes in the approach to managing these assets in the new circumstance are needed. Forests have been under increased pressure, caused by the disruption of the supply of electricity, coal, and gas to smaller settlements and by poorly controlled grazing.

Vulnerability to Natural Risks and Emergency Preparedness. The Caucasus features young geology and wild fluctuations of rainfall that, when combined, result in a high incidence of flash floods and mudslides. The country's location in a seismically active area poses special risks of oil spills and contamination, as well as losses of life and infrastructure in densely populated areas such as Baku. By contrast, the rise of the Caspian Sea is gradual and calls for a nonemergency response.

Vulnerability to natural risks is superimposed in Azerbaijan on an underlying vulnerability unrelated to natural occurrences, where multiple factors such as human dislocation in the wake of armed conflict, deterioration of health care, or accumulation of hazardous waste play a role. For now, Azerbaijan has retained much of the Soviet-era pattern of emergency and disaster response, structured around civil defense and responding to emergencies as and when they occur, rather than taking a more precautionary and integrated view of disaster management. Reorientation

of that approach is underway, but this is occurring more slowly than initially expected. The international community continues to fill substantial gaps in the Government's ability to respond on time and adequately.

Threats to Protected Areas and Ecosystems. The Caucasus is considered one of the world's 25 environmental hotspots (one of the 25 biologically richest and the most endangered terrestrial ecosystems in the world). That places Azerbaijan in a position of global responsibility that exists side by side with its own interest in preserving its wealth. A system of national reserves and protected areas exists, occupying a total of almost 5% of the country's total, operating with meager budgets, however. Among others, complex ecological processes link internal conditions (e.g., the state of rivers) with the ichtiofauna (fish) of the Caspian Sea, now under considerable threat. Azerbaijan has an uncommonly high number of recreational facilities, many of them in disrepair.

Regional Environmental Concerns (the Caspian Sea)**.** Environmental problems linked to the Caspian Sea include (i) overexploitation of biota, especially commercial fish species, most notably sturgeon; (ii) damage to coastal habitats, infrastructure, and amenities, in part related to fluctuating water level; (iii) degradation of coastal landscapes; (iv) threats to biodiversity; (v) overall decline in environmental quality, linked first and foremost to municipal and industrial discharges; (vi) threats to human health; and (vii) contamination from oil and gas operations. All these feature the work of the Caspian Environmental Program and combine impacts that are mainly national with those that are of a truly transboundary nature.

Regional Environmental Concerns (Transboundary Rivers)**.** The principal rivers in Azerbaijan originate outside the country, and their management has become a complex mix of imported problems and domestic weaknesses in protecting water quality. The level of discharges of heavy metals and other pollutants into the Kura and Aras in Georgia and Armenia is a subject given much prominence in Azerbaijan and rightly considered a topic of major geopolitical and public health significance.

Policy and Institutional Readiness

Legislation. As in other FSU countries, much of the Soviet-era environment-related legislation has been replaced or modified by now. The 1999 Law on Environmental Protection is the centerpiece of the new legal

structure. Other acts complement it in important ways. Together, the new laws invoke the polluter-pays principle, open the door for the use of economic instruments, partially bridge the gap between existing and international environmental standards, and enhance the role of public awareness, among other new elements. At the same time, the new legal edifice is neither complete nor internally consistent. The Law on Environmental Protection and the Law on Environmental Safety exist side by side without any obvious advantage of such a situation. Absence of suitable legislation limits responses to some of the key environmental concerns, such as hazardous waste management or coastal zone activities. The parallel approach to dealing with environmental assessments that combine the Soviet-era environmental expertise framework and the more recent environmental impact assessment-based one creates unnecessary complexity and adds to administrative cost. There is a disproportion between environmental obligations placed by laws on certain entities and these entities' ability to respond (e.g., the Land Law and municipalities).

If practice is several steps behind the legislative intent, incompleteness or weak formulation of implementation rules and regulations is among the causes. Duplication, inconsistencies across regulations, and lack of clarity at times create too much room for executive bodies to exercise their discretion. Many standards and parameters developed during the Soviet era have become dated and were overtaken by technological and other developments. Though simple in principle, the conversion of Soviet-era standards to internationally prevailing benchmarks (such as World Health Organization standards) is a time-consuming and relatively costly undertaking.

Instead of acquiescing to the popular view that everything would be fine if only the laws were formulated and implemented the right way, Azerbaijan's development partners need to recognize the continuous nature of legislative and regulatory development and pay more attention to detailed regulatory provisions.

Institutions. The Ministry of Ecology and Natural Resources (MENR) was established in 2001 to replace the former State Committee for the Environment, with an expanded mandate that includes geology, fisheries, and forests. MENR currently employs a staff of about 9,500 at the central and local levels. The major, even if indirect, role played in environment management by government bodies other than MENR is recognized. The most important among these are the Ministry of Economic Development, Ministry of Agriculture (with its Committee for Land Improvement and Irrigation), Ministry of Fuel and Energy, Ministry of Health, Ministry of Education, Ministry of Interior, Ministry of Transport, and Ministry of Justice.

The State Committee for Land and Mapping and State Committee for Architecture and Construction are also important. Each of these agencies has a unit (a department, division, center, or section) charged with the environmental dimension of their activities, attesting to a deliberate attempt by the Government to undertake environmental mainstreaming. Important also is the role of municipalities that are in charge of water supply and sanitation and land use decisions within their jurisdictions. The other elements of the institutional structure are the Parliamentary Standing Commission on Natural Resources, Energy and Environment, the academic community centered on the Azerbaijan Academy of Sciences, and about 80 environmental nongovernment organizations.

Among the institutional challenges are (i) insufficient devolution of environmental responsibilities to the local elected governments; (ii) overlapping responsibilities in water management (MENR, Ministry of Agriculture, Ministry of Health, municipalities, and State Committee for Architecture and Construction); land management (MENR, Ministry of Agriculture, and State Committee for Land and Mapping); and environmental monitoring; (iii) complexity of environmental assessment and other environmental safeguard procedures and associated institutional arrangements; and (iv) inadequate facilities for environmental monitoring at the local level.

Policy. By now, the Government's approach to environmental problems has a solid strategic anchor. The NEAP of 1997 includes elements of analysis and hints of needed policy reform and prioritizes environmental problems into 32 objectives. Although the NEAP's objectives have not been reached, most of its directions remain valid, and an updating of the NEAP is being considered. The 2001 National Environmental Health Plan offers an approach to environmental management based on health considerations, rather than mainly ecological ones. SPPRED 2003–2005, developed by the Ministry of Economic Development, acknowledges the many links between poverty and environmental conditions. It echoes the priorities of the NEAP and adds to them. The State Program on Environmentally Sustainable Socio-Economic Development 2003–2010, approved in 2003, addresses the principal dimensions of sustainable development, contains a time-bound plan of action, and gives MENR the primary role in guiding the implementation but envisages involvement of mainstream economic agencies in that process. The State Program for Restoration and Expansion of Forests 2003 proposes activities in 10 subsectors. Added to this body of strategic thinking must be plans and approaches developed under global or subregional environmental conventions or agreements. The most important

here are the National Caspian Action Plan and National Biodiversity Conservation Strategy.

Despite the flurry of strategic output, much remains to be done. First, formulation of policy in general, let alone in operational detail, has been slow in several key crosscutting areas where complex institutional mandates make the task particularly difficult. In the case of land degradation, serious attempts at articulating the policy started only in the last 2 years, in part coinciding with the national response under the United Nations Convention to Combat Land Desertification. The economic basis of these emerging documents is uncertain. In the case of hazardous waste management, despite a proliferation of efforts to address problems of multiple contamination of the Absheron Peninsula, no overall strategy of dealing with it exists that would suggest optimum sequencing of activities, corresponding zoning, the role of financial instruments in assisting the process, environmental liability rules, and others. The extent to which a nationwide hazardous waste strategy, now under preparation by MENR, will facilitate this task remains to be seen. In general, a number of activities contained in the State Program on Environmentally Sustainable Socio-Economic Development have not been sufficiently developed, let alone subjected to cost-effectiveness or benefit-cost analyses, as done, in part, in the NEAP. A second NEAP is probably required. The task is made more difficult by the paucity of fresh data in some instances.

Instances of a mismatch between policies' focus and the scale or nature of the problem are also found. The shift in the origins of air pollution from stationary to mobile sources in Baku has not been translated into increased policy attention to mobile sources, and the approach to water resource management continues to be sector-based, rather than river basin-based, and so on.

Pricing of resources and environmental services continues to be an area where much additional work is needed, despite important government decisions in 2002 targeting financial discipline in the energy and water sectors. Progress has been faster in the energy sector than in the water supply and sanitation sector. No attempt has been made to assess the effectiveness of the existing pollution charge system or take a comprehensive look at the question of environmental financing.

International Involvement and Development Partner Support. Azerbaijan has responded to virtually all principal international and subregional environmental conventions. Performance under these conventions has been uneven, with some delays in biodiversity, climate change, and land

degradation, but the record has been good under the Caspian Environmental Program.

A significant level of development partner funding directed at environmental priorities has materialized since 1995, once the worst of the refugee crisis and emergency assistance had passed. Not unlike in Central Asia, there may be a disproportion between the level of support for subregional and transboundary, as opposed to national, environmental activities. The coordination of development partner environmental assistance is totally inadequate, although working relationships are emerging among development partners in some key areas, such as water and sanitation. Development partner leadership in key environment-related spheres of activity (water supply and sanitation, land degradation, energy inefficiency, Baku air quality management, hazardous waste, and decontamination) is badly needed to complement the Government's efforts to achieve a greater degree of institutional coherence. Preparation of SPPRED II, structured around thematic groups, may offer an opportunity to act. The role of the private sector organizations as environmental development partners is insufficiently appreciated, and some potential lessons were missed.

Recommended Strategy

Building Blocks. The amount of time the Asian Development Bank (ADB) has been involved in Azerbaijan is too short to offer a firm basis for structuring potential assistance. In its absence, the environmental strategy relies on four main elements: (i) ADB's interim operational strategy for Azerbaijan, formulated in 2000 and subsequently updated in the form of country strategy and program updates; (ii) ADB's *Environmental Policy* of 2002; (iii) the Government's prioritization, culminating in SPPRED, State Program for Environmentally Sustainable Economic Development, and State Program for Socio-Economic Development of Regions 2004–2008; and (iv) consultations with the Government and others undertaken in support of this country environmental analysis.

ADB's environmental strategy should not attempt to address all environmental problems in Azerbaijan, perhaps not even the majority of them. ADB should understand the complexity but act selectively.

ADB's program needs to be linked to the poverty reduction strategy of the Government was articulated in SPPRED. In sector and environmental terms, SPPRED assigns priority to water and sanitation, broadly conceived to include waste management. SPPRED's concern about future sources of

livelihood and income growth further elevates the importance of activities targeting land degradation. SPPRED also assumes special importance because its repercussions for forest degradation and livelihood opportunities in the countryside improved availability of energy in small towns and rural areas (understood to include improved power or gas distribution and new sources of renewable energy for decentralized provision).

In addition to sector priorities for (i) water and sanitation, (ii) activities to counter land degradation, and (iii) energy provision for secondary towns and villages, sufficient grounds exist to include air pollution and traffic congestion in Baku as a fourth sector priority. The four sector priorities amount to a measure of deconcentration of assistance away from the Baku-Sumgayit area. This is clearly the case in land degradation and energy but less so in water and sanitation. There are good reasons, related mainly to waste management but also to transport management, for ADB not to abandon Baku and Absheron. This would also be in line with SPPRED, which envisages priority in social infrastructure (especially waste management) to be shared between Baku-Sumgayit and selected second-tier towns.

In terms of thematic priorities, existing emphasis on private sector and environment protection (among a total of four thematic priorities) should remain. The priority given to the former reflects the record of, and scope for, private sector cofinancing of environment-related activities in Azerbaijan The thematic preference for environment protection means no more (and no less) than giving prominence to environmental protection, regardless of the final choice of the sector mix by the new country strategy and program. This preference will typically be translated into an environmentally proactive design of projects and programs. No separate focus on internally displaced persons is recommended. Related issues instead should be handled as part of regular government programs.

Programming Possibilities. The broad sector and thematic prioritization has been translated into specific programming recommendations (Table 1). These have been newly formulated, rather than being bound by the tentative prioritization of the latest (2004–2007) country strategy and program update.

Table 1: Programming Recommendations

Sector Priority	Component and Policy Emphasis	Specific Proposals
1. Water and Sanitation	A. Water and Wastewater Large unfinished institutional reform agenda should remain at the forefront of Asian Development Bank involvement in the sector. Local specifics (nonfunctioning overcapacity) may demand pragmatic approaches to cost recovery. Emphasis on secondary towns.	*Lending Products* Water Supply and Sanitation *Nonlending Products* Capacity Building for Regulatory Reform in Water Supply and Sanitation Sector (including Low-Cost Approaches to Improving Access to Water in Azerbaijan's Cities)
	B. Solid and Hazardous Waste ManagementA coordinated institutional response should be the starting point. Fresh prioritization is needed, as are adequate attention to technical and legal complexities and active search for incentives to involve the private sector.	*Lending Products* Rehabilitation of Contaminated Sites in Greater Baku and Integrated Urban Development or *Nonlending Products* New Approaches to Rehabilitation of Contaminated Sites in Greater Baku
2. Land Degradation	A. Irrigation, Drainage and Land ReclamationAssessment of the World Bank's and Islamic Development Bank's experience under the Samur-Absheron project will precede project formulation. The project has irrigation and water supply (for the Absheron Peninsula) dimensions. Opportunities for making it a tool for environmental improvement as well as one for linkage to improved management of water in Baku will be emphasized.	*Lending Products* Samur-Absheron Water Supply and Irrigation (loan) and *Nonlending Products* Improved Management of Small Rivers in Azerbaijan and Water Resource Assessment

continued on next page

Table 1: Programming Recommendations
(continued)

Sector Priority	Component and Policy Emphasis	Specific Proposals
	B. Reforestation and Pastureland Management This will be anchored in the Government's 2004 review of pastureland, State Program for Restoration and Expansion of Forests 2003, and National Action Plan to Combat Desertification. Public awareness and sustainability incentives will occupy a prominent place.	*Lending Products with Global Environmental Facility Cofinancing or Poverty and Environment Program Grants* Forest Rehabilitation to Reduce Poverty and Protect Global Values and *Nonlending Products* Preparation of a National Program for Soil Conservation
3. Decentralized Energy	Decentralized Energy ProvisionAn unfinished policy agenda centered on cost recovery will be a part of the assistance package.	*Lending Products* Decentralized Energy Provision (including Renewable Energy)or *Nonlending Products* Capacity Building of Ministry of Fuel and Energy and Exploiting the Potential for Renewable Energy Sources in Azerbaijan
4. Transport	Mobile Source Pollution, Congestion, and SafetyThe loan will draw on the Asian Development Bank's substantial Asian experience in this domain, including its policy aspects.	*Lending Products* Baku Air Quality Improvement Sector Development Program and *Nonlending Products* Applying Asian Experience to Reducing Vehicular Emissions

Introduction

Azerbaijan joined the Asian Development Bank (ADB) in 1999, and ADB's operations in the country started in 2000. Even more than in the Central Asian countries of the former Soviet Union, ADB is a relative newcomer to the development process in the Southern Caucasus. At the same time, Azerbaijan's geopolitical status, which compelled a number of international and multilateral organizations to establish an early presence there, has meant that a considerable pool of experience exists, on which ADB has been able to draw, although unevenly. In the area analyzed (i.e., environmental management), instinctive appreciation by ADB of its importance for Azerbaijan existed from the beginning, but only in 2004 did a more systematic assessment begin, in the form of the Urban Environmental Profile of Azerbaijan, which was completed by the Social Sectors Division of the East and Central Asia Department.

This country environmental analysis goes further and beyond urban environments. Its main purpose is to be an input into the country strategy and program, the first full country strategy and program for Azerbaijan, which will replace the annually updated interim strategies and programs that have guided ADB's operations in Azerbaijan until now. This analysis identifies environmental constraints and assesses policy responses, institutional preparedness, and the extent to which environmental concerns are woven into the economic mainstream. It then links these considerations to ADB's existing and planned activities in the country concerned. In essence, it is ADB's environmental strategy for the country.

The drafting of this analysis was facilitated by the recent completion of a comprehensive environmental performance review of Azerbaijan by the United Nations Economic Commission for Europe. A number of other documents have appeared in the last few years, or earlier ones have been updated. Between them, the 2002 United Nations Commission on Sustainable Development Azerbaijan Country Profile, prepared for the Johannesburg Rio+10 Summit and the United Nations Environment Programme-commissioned material (www.UNEP.net) provide a good general picture. Reports prepared under the auspices of the Caspian Environment Program include detailed technical reports as well as strategic

documents, such as the National Caspian Action Program. A number of national submissions to international environmental conventions have been completed in association with the Global Environmental Facility and the United Nations Development Programme. The Government of Azerbaijan has not been idle either, and with varying degrees of outside support produced several strategic documents, including the National Environmental Action Plan (NEAP), enacted in 1997 with World Bank's support; National Environmental Health Program (National Environmental Health Action Plan, with the World Health Organization's support); State Program for Environmentally Sustainable Socio-Economic Development (2003, with United Nations Development Programme support); and State Program for the Rehabilitation and Expansion of Forests (2003), to mention only the principal documents originating either in the Ministry of Environment and Natural Resources or the Ministry of Health. Huge information overlaps exist, reflecting duplication of efforts by development partners, along with a shortage of up-to-date information needed to formulate investment projects in some areas.

Several sector guidance documents (strategies, action plans, and others) dealing with topics of major environmental relevance, such as water management, agricultural development, municipal affairs, and others, have been prepared under development partner assistance and to varying degrees have been translated into government legislative and other programs.[1] These are described in various places in the text.

Taken together, this body of work is more than sufficient to address Part I, Part II, and some of Part III of this analysis. No claim to originality is therefore made. Instead of mainly reproducing information available,[2] these sections attempt to make certain generalizations intended to assist and clarify the process of environmental strategy formulation, highlighting (throughout) the policy dimensions of environmental concerns and responses to these. The new element is Part IV, which spells out the implications of the existing situation for ADB and recommends the place and form of environment-related matters in ADB's future assistance to Azerbaijan.

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[1] A typical example is the World Bank-commissioned Water and Wastewater Strategy, drafted in 1999–2000, which is not yet reflected in updates of the existing Water Law (1997) and other pieces of legislation.

[2] To compensate, the list of references is relatively comprehensive and selected with care. Also, some of the most telling data are summarized in Appendix 4.

A. Hydrocarbons, Economic Development, and the Environment in the Southern Caucasus

To write about Azerbaijan's economy without starting with oil would be difficult. The oil sector is a source of wealth in Azerbaijan, but it generates just over 1% of employment.[3] The $2.23 billion in oil exports in 2003 accounted for 86% of that year's total exports. The medium-term prospects of oil revenue are bright, necessitating attention to neutralizing the potential fiscal and monetary impacts of the bulging oil revenue but also raising questions about the manner and speed of investing this revenue in the country's social and economic development, including its environmental dimension. As in Kazakhstan and Turkmenistan (but not Kyrgyz Republic or Tajikistan), the hydrocarbon resources could be the engine of Azerbaijan's further modernization.[4] Unlike Central Asia's two emerging hydrocarbon superpowers (Kazakhstan and Turkmenistan), Azerbaijan is where the industry started more than 100 years ago, and in physical terms these may well be its mature years, although admittedly given an additional lease on life by the post-1995 inflow of foreign capital.[5]

In environmental terms, the long history of oil exploration (supplemented during the Soviet days by the petrochemical industry) has left the country with a massive legacy of oil and other chemical pollution, both land-based and offshore. At the same time, the industry's importance

[3] The relative contribution to employment of (non-oil) industry continues to decline (to about 5% at present), shifting even more of the burden of employment creation onto the trade and service sector, and the countryside.

[4] For a convenient overview of oil production aspects, see the United States Department of Energy website (www.eia.doe.gov).

[5] The cumulated foreign direct investment between 1995 and 2003 reached $5.4 billion. Of this, about three quarters were allocated to the oil and natural gas industries. For the sake of comparison, Azerbaijan's gross domestic product in 2003 was $7.1 billion, at current prices, and development partner assistance (including lending by international financial institutions) from 1991 to present has reached $1.5 billion. In the last 3 years, however, foreign capital has begun to outstrip private capital inflows.

and the presence in the country of modern foreign operators (alongside the State Oil Corporation) have revitalized the environmental debate and practices.[6]

B. Poverty and Environment

While until now, poverty has been largely measured by the level of per capita income, now this phenomenon is understood in broader terms. Today, poverty reduction means improving access to basic resources, including land and water, as well as to employment, education, and health care services, ensuring equal rights for women at all levels, meeting needs for infrastructure and utility services, improvement of sanitary and hygienic conditions (Minister of Economic Development Farhad Aliev [Republic of Azerbaijan 2003b]).

It says a lot about the difficulties of the transition process that despite its oil wealth, Azerbaijan is plagued by poverty, much of it new poverty. The Household Budgets Survey, conducted by the State Statistical Committee in 2001, estimated that 49% of the population lived in poverty, if the absolute poverty line of AZM120,000 ($25.8) per capita per month was used. Seventeen percent of the population lived in extreme poverty when the relative poverty line was set at AZM72,000 per capita per month. The Household Budgets Survey found that, defined in income terms, poverty in Azerbaijan was greater in urban than in rural areas (55%, as opposed to 42%). Poverty in Baku was at about the national average but lower than in other urban areas (i.e., poverty was the most intense in secondary towns). Baku's demographic dominance means that the city contains the largest group of poor (one quarter of the total). Going beyond incomes to other dimensions of poverty, it is once more smaller towns that suffer disproportionately from unreliable supplies of energy and gas, declining infrastructure, and less access to basic health and education services.

Compounding the difficulties are about 750,000 people (i.e., more than 10% of the total current population) displaced by the conflict with Armenia. Internally displaced persons (IDPs) are known to be significantly poorer on average than the rest of the population. In environmental terms, this has added to the pressure on the hosting areas, both rural and urban,

[6] Best illustrated in the establishment of the Baku-based International Eco-Energy Academy in 1996 as a meeting place for members of Azerbaijan's scientific community and (mainly oil) industry representatives. The academy's journal *Energy, Ecology, Economy* offers an excellent perspective on the evolution of the environmental debate in the country.

demanding more attention to things such as pastureland management and provision of basic urban environmental services.

Despite the turbulence of the independence period, especially the first half of 1990s, overall health indicators (and millennium development goals), including life expectancy and infant mortality, show improvements since 1989 and compare favorably with those of mountainous Central Asia (Kyrgyz Republic and Tajikistan). Infant mortality more than halved between 1989 and 2001. The Caspian Health Profile 2002 (Caspian Environmental Program 2002a) contains extensive data for coastal provinces, including Baku and Sumgayit.[7]

C. Structural Features of the Azeri Economy and Their Environmental Dimensions

Similar to the situation in other former Soviet Union (FSU) countries, Azerbaijan's economy contracted severely in the immediate aftermath of independence (real gross domestic product declined by 52.6% between 1990 and 1994), but by 2001 the economy was back at about three fourths of the 1990 level. The collapse of industrial employment was initially offset, in part, by a return to land (i.e., subsistence or for-cash farming). Agricultural employment peaked in 1999 at almost 40% of the total. Agriculture now employs about one third of the workforce but accounts for only 14% of gross domestic product (2002). In the meantime, the oil sector has been invigorated (with a negligible impact on employment, as pointed out earlier) by an inflow of direct foreign investment, and trade and services have gained in importance within an economy in which the private and state sectors have approximately switched their relative importance (from 30:70 of gross domestic product in 1990, respectively, to 70:30 in 2003). These structural shifts notwithstanding, diversification of Azerbaijan's economy and attention to non-oil industries and decollectivized agriculture are among the country's stated priorities. Elsewhere (World Bank 2002), World Bank has estimated that unofficial activity accounts for over half of Azerbaijan's overall economy.

[7] Costal provinces, as defined under the Caspian Environmental Program, include an area of over 14,000 square kilometers and about 40% of Azerbaijan's population. The available statistics are not detailed enough to document the often quoted adverse impacts on health (in particular high infant mortality) caused by industrial pollution and waste around Sumgayit. The degree to which reported data reflect lowered availability of free or subsidized health care cannot be adequately analyzed here. Also, recent assessments by the United Nations Children's Fund paint a less positive picture of infant and maternal mortality.

In common with other newly independent states, Azerbaijan is an urbanized society (urban population around 55% of the total). Baku alone accounts for about one third of the country's population. However, secondary cities in Azerbaijan (Ali Bayramli, Ganja, Mingechevir, and others) have a role to play and their own environmental problems.

The Second Program for Privatization of State Property was launched in 2000,[8] under which many large, state-owned enterprises are to be privatized. The program began in 1995,[9] and during its initial phase, more than 29,000 small and 1,000 medium and large state-owned enterprises and facilities were privatized through check and cash auctions, closed subscriptions, and auctions. In March 2001, the Government identified several hundred more enterprises and joint ventures to be privatized or put under long-term management contracts with private investors. Official statistics put the private sector's contribution to gross domestic product at 68% in 2000 (compared to 29% in 1994). About 90% of Azerbaijan's farmland is now in private hands. The state retains a major stake in the oil sector, through the State Oil Corporation and, for now, in energy generation and distribution (through Azerenergy). However, private sector-driven reform and restructuring of the electricity and natural gas industries is under way, assisted by the World Bank's Public-Private Infrastructure Advisory Facility.[10] The role of the private sector in water supply and wastewater management has drawn the increased attention of state authorities.

First, some environmental implications of these postindependence trends are obvious, and others are less obvious. Many environmental problems arose because of independence, while others lessened with the rejection of the Soviet way of doing things. First, the precipitous decline in non-oil industrial output substantially reduced all types of industrial discharges and water use (the obvious part). The same decline, however, has left the burden of past pollution (e.g., contaminated soils and old stocks of hazardous waste) largely unchanged and, indeed, reduced the ability of the industry to take on some of the burden of past pollution. Instead of mainly dealing with current emissions, the challenge of the Azeri authorities

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[8] The Law on Privatization of State Property of 2000, superseding earlier privatization decrees and programs.

[9] For details see the Government of Azerbaijan's 1998 privatization procedures (English version available at www.pangaeapartners.com).

[10] That does not mean that privatization has been easy. After a failed privatization of 16 electricity distribution networks in 2000 (bids were received for only 4 networks), Azerbaijan decided to divide the national grid into five zones [Baku, Nakhchivan, North (Sumgayit), South (Ali Bayramli) and West (Ganja)], then form joint-stock companies at these regional grids and invite foreign investors to manage them. Power stations are to remain state-owned initially. In November 2000, the Ministry of State Property began the privatization of the Baku Electricity Network.

is how to deal with the legacy of past pollution. As well as permanently reducing the emissions of operating facilities, ways need to found of paying for the eventual dismantling of corroding remnants of Soviet-era facilities rendered obsolete and unviable in the new geopolitical circumstances. Nowhere is this more obvious than on the Absheron Peninsula, between the contaminated sections of some of Greater Baku's districts and the industrial city of Sumgayit, both of which provide a vivid illustration of that sort of challenge, repeated many times (although usually on a smaller scale) in other parts of the FSU. That such efforts require not only technical and financial resources but also policy advances, to deal with subjects such as environmental liability, is perhaps clear.

Second, trailing the trend of postindependence, gross domestic product has been a serious curtailment of investment in public infrastructure, including its environmental components (water, wastewater treatment, and waste management). The impact has been magnified by the mismatch between the capacity created during the Soviet era and capacity that would be suitable for a market economy in which resources are priced at close to marginal cost (rather than at administratively set prices). Deterioration of facilities that under a new approach to valuing resources turn out to be too big has vast financial consequences with which the Government will need to grapple. A breakdown of financial discipline is an aspect of the problem: estimates of effective 2002 collection rates for household electricity in Azerbaijan vary according to the source of information and the consumer segment under study, and start at as low as 13.8% and as high as 50.7% for gas.

Third, the one-sided economic growth of recent years has further added to regional disparities. The Absheron Peninsula, with Baku and Sumgayit, accounts for 50% of the country's population and is a home to more than 80 big, 370 medium-sized, and 2000 small industrial enterprises. The Kura River, with the towns of Ali-Bayramli, Mingechevir, and Neftchala on its banks (and Ganja not very far away) represents another clustering of economic activity and population. The upsurge of foreign investment in the oil and gas sector since 1996 has further underlined the economic dominance of the coastal area and the Absheron Peninsula in particular.

Fourth, given the difficulties of privatizing or otherwise restructuring large-scale inefficient state enterprises, future growth in the non-oil sector is occurring mainly among small and medium-sized enterprises. Official statistics list over 47,000 small enterprises in 2002 (up from 4,600 a decade earlier). This will demand recognition by the environmental regulator and suitable calibration of pollution monitoring and clean-production activities.

D. Land Use and Land Reform

On the land use and agriculture side, developments similar to those observed in other newly independent states are much in evidence in Azerbaijan. The former collective farms have been dismantled. The relative importance of grains, potatoes, vegetables, and animal husbandry (in particular sheep or goats) has grown in importance (Table 2) at the expense of land-based activities requiring scale and cooperative action (plantation crops, such as grapes,[11] cotton, tobacco, and green tea, or the production of seed material). Official figures record a decline in the output of all livestock products, except milk, but there are good reasons to believe that unrecorded production distorts the true situation.

Table 2: Changes in Cropping and Land Use Patterns
(1990 and 2003)

Crop and Land Use	**Area** ('000 hectares)	
	1990	2003
Grains	583	776
Vegetables	75	164
Industrial Crops	282	89
Cotton	264	67
Fodder	522	190
Fruit (other than grapes)	136	88
Grapes	181	8
Tea	13	4
Fallow	64	4

Source: State Statistical Committee. 2005. *Azerbaijan Statistical Yearbook 2004*. Baku.

[11] The case of vineyards is particularly striking. The dramatic reduction presented in Table 2 has its origins in mandated uprooting of vineyards under the antialcoholism campaign in the twilight days of the Soviet era. The loss of traditional outlets following the FSU's dissolution accounts for the rest, as the environmental impacts were often mixed. Conversion of former vineyards to wheat increased soil erosion but resulted in a sharp drop in pesticide use rates, once among the highest in the world for this type of crop.

The pressure on pastures has increased.[12] Some of the functions previously performed by the *kolkhozes* (collective farms)–for example electricity provision;[13] infrastructure maintenance; and, crucially, irrigation and salinity control–are either no more or have considerably suffered. Azerbaijan's countryside is littered with abandoned and dilapidated kolkhoz and *sovkhoz* (state farm) infrastructure.

Overall, these changes have safeguarded livelihoods but worsened land use (in particular the vulnerability to soil erosion), especially in hilly areas where perennial crops have been replaced by annual crops (e.g., from vineyards to wheat). At the same time, Azerbaijan's land reform seems to have been a major success and is more advanced than in any other FSU country, except perhaps the Baltic republics. About 1.7 million out of 8.6 million hectares of land are now under private management, and about 2.1 million are under municipal management. The land market, one of the keys to increasing the very low agricultural productivity in postindependence Azerbaijan, is thus emerging, backed by an unusually strong (for FSU countries) land administration. Former pasture- and forestlands (whether previously under kolkhoz management or direct state management[14]), roughly three times the area of privatized arable land, have not been touched by the reform, however, and some of the environmental problems related to land use are found there. While privatization may not be appropriate in these cases, changes in the approach to, and mechanisms of, managing these assets in the new circumstance are needed.

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[12] This typically takes the form of reduced discipline in moving animals between winter and summer pastures as well as an increase of stocking density.

[13] The use of electricity by the agriculture sector declined from 3,287 million kilowatt-hours in 1990 to 827 million kilowatt-hours in 2001.

[14] Kolkhozes and sovkhozes also often managed some forests and pastures. While arable lands were distributed to households following the collectives' dissolution, forests and pastures in theory reverted to the State for management. However, this process has not been followed strictly and some de facto reclassification to private land (either as arable lands or *priusadki* [household plots]) or municipal land has occurred. The issue of land degradation in Azerbaijan then concerns three main categories of land and effects: (i) private arable lands under main threats of salinity and erosion; (ii) former kolkhoz and sovkhoz nonarable lands, some of them possibly misclassified or temporarily classified as municipal lands; and (iii) state forest- and pastureland under a variety of familiar pressures (overgrazing, forest degradation, and others).

Main Groups of Environmental Concerns and Issues

These are summarized in the following paragraphs roughly in the order originally presented in the NEAP of 1997 (www.eco.aznet.org) and since echoed (less well) in the United Nations Environment Programme (UNEP)-Government of Azerbaijan State of the Environment and, more recently, State Program for Environmentally Sustainable Economic Development (SPESSED). Some sections draw on the material used in ADB's Urban Environmental Profile; various national reports and plans, including National Environmental Health Action Plan (NEHAP) (Republic of Azerbaijan 2001); documents prepared under the Caspian Environmental Program;[15] and the United Nations Economic Commission for Europe (UNECE)'s *Environmental Performance Review of Azerbaijan*.

In Azerbaijan, a distinct spatial pattern of environmental concerns exists. Simplified to a maximum degree, an environmental map would have five main zones:[16] Absheron Peninsula (industry-related, water-related, and municipal problems); the Kura-Aras lowlands (agriculture-related issues, especially salinity but also some industry-related problems and environmental sanitation problems in smaller towns); and the mountain districts (Great Caucasus, Lesser Caucasus, and Talysh mountains and their foothills, with soil erosion and land degradation dominating). Two transboundary zones could be added, encompassing, respectively, transboundary rivers and the Caspian Sea.

[15] See the list of references for details.

[16] A different classification is used in State Program for Socio-Economic Development of Regions (SPSEDR), where prevailing economic reality rather than ecological factors guides the grouping, which structured as follows: (i) Absheron, (ii) Ganja-Gazakh, (iii) Sheki-Zakatala, (iv) Lenkoran, (v) Guba-Khamchaz, (vi) Aran, (vii) and (viii) Nagorno-Karabakh, (ix) Mountainous Shirvan, and (x) Nakhchivan. SPSEDR contains a succinct description of the economic features of each region. By contrast, the approach adopted in the State of the Environment report is based on five climatic zones (i.e., the Greater Caucasus, Lesser Caucasus, Nakhchivan, Lenkoran, and Kura-Aras. It also distinguishes 19 physical-geographic districts and four regions SE part of the Greater Caucasus, Lesser Caucasus, Kura plains, and Lenkoran).

If the summaries of environmental concerns below have a technical rather than spatial basis the location factors are always present, in some instances (e.g. old waste remediation) providing a useful additional focus.

A. Pollution from Industrial and Energy Production, Transport, and Other Sources

Oil Contamination and Hazardous Waste. Some 10,000 hectares of land on the Absheron Peninsula have been contaminated by oil as a result of decades-long (and careless) oil and gas exploration and exploitation in that area and its foreshore. The extent of hazardous waste disposal by enterprises in Sumgayit, established in 1940s as the FSU's leading petrochemical (and metallurgy) base, has been subject of numerous reports.[17] The degree of recycling and neutralizing of hazardous waste has declined significantly since 1991, in line with the disruption of links among different industrial facilities, in the aftermath of independence (Appendix 4). Recent activities to decontaminate oil-affected soils and deal with mercury sludge by development partner-supported undertakings (European Union Technical Assistance to Commonwealth of Independent States [EU TACIS], Netherlands, and Norway, and World Bank,)[18] have been mostly pilot in nature[19] and have not broken the back of the problem. The cocktail of hazardous waste is a potent one not limited to oil and mercury but including also storage of obsolete agrochemicals and low-level radioactive waste.[20] Declared an ecological disaster zone 1992, later (1995) attempts to tackle the environmental decline in Sumgayit through a revival of the town's economic fortunes (e.g., establishment of a free economic zone) appear to be stalled. There is no shortage of official calls to clean contaminated sites and adopt best of international practices. A hazardous waste management agency was created within the Ministry of Environment and Natural Resource (MENR) in 2003. A national hazardous waste strategy developed

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17 Among the many, see Hajiev and Huseynova (2000) and Islamzadeh and Kalilova (2003).

18 Please refer to Appendix 9 for details of recent development partner activities in Azerbaijan.

19 It is important to add that decontamination and soil recultivation research in Azerbaijan predate the dissolution of the Soviet Union.

20 Radioactive waste may not be as big a concern in Azerbaijan as it is in some other FSU countries (e.g., Kazakhstan or Kyrgyz Republic, with their polygons [i.e., hazardous and nuclear waste landfills]), but the management of low-level radioactive waste has been seriously inadequate (see Nuclear Threat Initiative coverage at *www.NTI.org*). Under European Union special assistance, storage and monitoring facilities of the Baku Centre for Radioactive Isotopes (popularly known as Izotop) are to be upgraded.

with World Bank backing now exists in draft form. Among the missing ingredients are contemporary waste legislation, waste inventory system, and use of market-based approaches to dealing with the problem (landfill fees, recycling incentives, and others). The existing and potential problems of transboundary movement of hazardous waste also need attention.

Solid and Hazardous Waste. Annually, an uncertain quantity (indirectly estimated to be around 1 million cubic meters per annum) of solid domestic waste, often mixed with nontoxic industrial waste and hazardous substances, is generated in cities and other settlements in Azerbaijan.[21] The largest part of this waste is delivered to landfills, some official others unorganized. Normally, private companies contracted by municipalities perform the collection and disposal. About 80 unorganized landfills exist in Baku (to supplement the four official landfills) and about 200 exist throughout the country. None of the landfills meet international sanitary standards. Smaller towns tend to have the lowest and least well organized disposal, with repercussions not only for the quality of local life but also for surface water quality. This is the case particularly in settlements vulnerable to periodic flooding. Waste is often burned in the open.

Except for bottles, there is no waste separation. Management of landfills, where it exists (e.g., the Balakhany landfill outside Baku), is a matter of simple compacting. A very low percentage of waste is recycled. Official figures may well underestimate the extent of informal recycling, but, even if they do, the underlying inadequacy of solid waste management is all too obvious. Several new organizations or companies (such as NASA-affiliated Physical Environment Research Center or Azerbaijanskaja Ecologicheskaja Laboratorija (AZECOLAB) and some nongovernment organizations) have appeared recently, attempting to tap the existing scientific know-how and adapt it to the needs of waste recycling and waste remediation.

As to medical waste, in the larger facilities of Baku, medical waste tends to be disinfected by hypochlorite solution before disposal, and syringes and sharp objects are separated, but such practices are not normally followed in smaller facilities in the countryside. An international nongovernment organization, International Medical Corps, has been introducing government-approved incinerators in its community-based health care programs in selected districts of the country.[22]

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[21] Existing regulations demand a higher payment for the disposal of hazardous waste (further differentiated) than nonhazardous waste. Yet, facilities suitable for hazardous waste are usually missing.

[22] See www.unece.org/env/epr/studies/azerbaijan and ADB's Urban Environmental Profile for an interesting discussion of health-environmental links.

Energy Inefficiency and Air Pollution. That the newly independent states (of the FSU) hold the dubious distinction of being the world's least efficient group of energy users (measured by any variant of the ratio of energy used per unit of output value) is well known. Azerbaijan remains close to the top of the inefficiency list, although its relative performance since the mid-1990s shows a distinct improvement, admittedly from an alarmingly high level (Appendix 4).

In the power sector, wear and tear of equipment (most equipment is several decades old) and decreased use of natural gas in relation to heating oil in the thermal sector have been the most telling factors.[23] Elsewhere, outdated equipment; poor maintenance; and, until recently, little energy efficiency awareness have been among the contributing factors.

Air pollution incidence (Table 3) is closely correlated with the distribution of industrial input, and not surprisingly, Baku and Sumgayit have traditionally dominated the outcome. Gross air emission totals there have declined substantially in line with the collapse of non-oil industrial output, and (for now) ambient air quality is getting close to existing air quality standards.[24]

Table 3: Pattern of Air Emissions in Azerbaijan, 1990–2002
('000 tons)

	1990	1995	2002	2003
Total	**2,108**	**879**	**217**	**426**
Baku		624	110	331
ParticulateMatter	148	23	29	34
Gaseous Matter	1960	856	188	392
Sulfur Dioxide	90	50	14	15
Nitrogen Dioxide	59	32	26	24
Carbon Monoxide	71	22	18	25

Notes:
1. The significant drop in air emissions in 2002 probably reflects underrecording in that year linked to the dissolution of the former State Committee for Environment and its replacement by the Ministry of Environment and Natural Resources.
2. Ali-Bayramli, Hajigabul, Mingechivir, Salyan, and Sumgayit, are the only secondary towns where total air emissions after 1997 exceeded 10,000 tons.

Source: State Statistical Committee. 2005. Azerbaijan Statistical Yearbook 2004. Baku.

[23] At present, Azerbaijan's power sector has an installed generating capacity of approximately 5.2 gigawatts. Eight state-owned thermal plants account for about 80% of that. Six hydroelectric plants complete the picture. Both electric generation and consumption have been relatively flat since independence, with generation totaling 18.7 billion kilowatt-hours in 2002, and consumption of 17.4 billion kilowatt-hours. Because of the country's inefficient distribution network, Azerbaijan imports some of its power from Iran, Georgia, Russia, and Turkey to make up for transmission losses (7% of total generation in 2002).

[24] Caspian Environmental Program (2000c) and Hajiev and Huseynova (2000) provide a detailed statistical picture of industrial air emissions in Azerbaijan throughout the 1990s.

Official figures[25] point also to a very recent (2003–2004) improvement in the overall degree of pollution abatement, reflecting the commissioning of several large modern facilities. While emissions by stationary sources are being held in check, those by mobile sources have continued to climb, and their total volume now outstrips the former category. Despite a favorable pattern of pollutants' dispersion,[26] the situation is becoming acute in Baku and is likely to deteriorate further without resolute action. A system of pollution charges on stationary emissions has been in place since 1992, but its effectiveness is in doubt, despite reported achievements of the last 2 years.

The problem of energy inefficiency is being increasingly recognized. In 1999, the Energy Saving and Management Center was established (with EU TACIS assistance) and a similar center (the Clean Production and Energy Efficiency Center) was added in 2003, with Norwegian backing. Among the tasks of these centers is to identify the most promising energy-saving technologies (that range from simple and inexpensive measures, such as fixing steam leaks and radiator valves, to more capital-intensive investments, such as new boilers, electric motors, and process control systems); projects; and policies. Significant scope for better energy efficiency exists in residential and commercial buildings. In all cases, reform measures target the causes of the problem, which include insufficient research into and commercialization of energy; corruption (resulting in lack of financing, low tariff collection, cross subsidies); information and educational gaps; and absence so far of regular energy audits (Abulashvili 2003). An energy efficiency action plan may well be needed, together with suitable incentives.

This analysis is not the place to deal with the specifics of the power sector restructuring, except to note (i) extensive involvement of international financial institutions (European Bank of Reconstruction and Development, Japan Bank for International Cooperation, and World Bank) and some bilateral assistance in rehabilitating existing capacity;[27] (ii) the essential role played by rehabilitation and possible extension the power transmission network in averting new pressures on the environment caused by the disruption or outright disappearance of power supply to many towns and settlements where fuelwood has become a substitute for electricity or gas; (iii) positive impact on energy efficiency of expected liberalization of the

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[25] Table A4.4, Appendix 4

[26] Baku (from Persian Bad *kube*) means "hit by winds."

[27] In particular, completion of the Yenikand hydropower plant with World Bank assistance in 2000, Mingechevir hydropower plant with European Bank of Reconstruction and Development assistance in 2001, and upgrading of the Severnaya thermal plant with Japan Bank for International Cooperation funding in 2002. Azerenergy is said to be considering numerous options to develop the country's distribution network and increase its generation capacity.

energy market; and (iv) a perhaps predictable underdevelopment of renewable energy (other than hydro and minihydro) in oil-rich Azerbaijan.[28] The National Environmental Action Plan (NEAP) contains specific targets for renewable energy development but only some of these have been acted upon. However, recent government plans include development of geothermal resources. A national program on alternative and renewable energy is about to be completed by MENR.

Mobile Source Emissions and Transport. In 1997, the NEAP easily identified the phasing out of leaded gasoline as a major environmental priority. In 1998, under the environment-for-Europe process, Azerbaijan committed itself to phasing out leaded petrol by 2005.[29] The difficulties of achieving this target[30] relate mainly to the age and structure of and absence of catalytic converters in a significant percentage of the existing fleet. The number of private car registrations in Azerbaijan increased from 260,000 in 1990 to 370,000 in 2003. The NEAP's and others' calls for a more pro-environment structure of vehicle and fuel taxation have not been heeded so far.[31] The momentum evident between 1998 and 2000, when wide publicity was given to the subject (World Bank and Canadian International Development Agency 2000) seems to have petered out in the last 2 years. The level and quality of vehicle emission monitoring in Azerbaijan is poor. The situation is reminiscent of that in most developing countries of Asia.

As in many other instances, Baku stands out. Here the problem of vehicular emissions is compounded by increasing congestion, incidence of road accidents, and police corruption. The problems are sufficiently similar to those experienced by many cities of the world, and solutions may well be similar also.

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[28] That does not mean that no work has been done in this area. See, for example, Mustafayev, et al. (1997); Ismailov (2002); European Bank of Reconstruction and Development (2002); and *Energy, Ecology, Economy* (2004).

[29] This was a culmination of a process initiated in 1996 by UNECE, with the wide support of the European Union, European Bank of Reconstruction and Development, World Bank and others, resulting in a regional strategy for the phaseout of leaded gasoline. The regional strategy sets targets also for a reduction of diesel sulfur content to 0.20% by 2005 and 0.05% by 2015.

[30] Azerbaijan officially stopped producing leaded gasoline in 1997 but some leaded gasoline is still being sold.

[31] Vehicle import tax, based on engine size, is lower for vehicles less than 1 year old but identical for all vintages older than 1 year. This is not enough of an incentive not to buy older inefficient models.

B. Water and Wastewater Management

Only 30% of the river flow volume in Azerbaijan originates within the republic itself. Azerbaijan is the last among the countries of the Southern Caucasus in terms of surface water availability, whether measured in per capita or per unit of area terms. Within the country, the distribution of water is uneven, with the Absheron Peninsula and the lower Kura and Aras basins (roughly, the eastern locations of the country) being the driest. Agriculture uses about two thirds of the total water available. Industry and households use the remaining third. That proportion changes, however, from locality to locality. (On the Absheron Peninsula, for instance, that relationship is inverse.) Water allocation quotas by type of use and location have existed since the 1970s, their effectiveness under the current conditions is not certain. The conditions of the Kura-Aras basin on which much economic activity in Azerbaijan depends is a complex mix in time and space of flooding, water shortages, degrees and types of water pollution, and threats to ecosystems.

The overall balance of wastewater discharges in Azerbaijan has changed significantly since independence. Reduction of industrial wastewater discharges accompanying the contraction of industrial output has been offset by lowered treatment of municipal discharges (ADB 2004a). The combined effect has been complex in terms of chemistry, but the seriousness of the problems has not diminished.

Irrigation and its Environmental Dimension. A general shortage of water for agriculture in the lowlands spurred an investment in irrigation that predates the Soviet Union (e.g., *kahriz* [traditional system of subterranean water conveyance] in Nakhchivan) but reached its zenith during the Soviet era, when a total of about 1.4 million hectares (or approximately one third of all cultivable land) was irrigated. The system now comprises 10 main canals and 2 main drains.[32] The bulk of irrigation water comes from surface sources, but about 5% (or about 12 billion cubic meters per annum) is groundwater. Less than 4% of the total of 66,000 kilometers of canals are lined, and this, together with poor irrigation practices and inadequate infrastructure maintenance since independence, has contributed to significant water losses (irrigation efficiency at the national level is estimated at only

[32] For more detailed information see FAO's AQUASTAT website (www.fao.org/ag/agl/aglw/aquastat).

55%), rise of groundwater level, and waterlogged soil and secondary salinization. Out of the 1.4 million hectares once equipped for irrigation, only about two thirds are being irrigated and about 0.6 million are now affected by salinity:[33] 10% are salinized to a high degree, 20% to a medium degree, and 70% to a slight degree. It is estimated that drainage for 350,000 hectares of land needs major rehabilitation. Effective losses of irrigated or irrigable land may well be the single most costly (in economic efficiency terms) category of land degradation in Azerbaijan.[34] The State Committee for Land Improvement and Irrigation issues water abstraction permits for agricultural use and collects payments for irrigation water.

Municipal Water and Wastewater Management. Piped drinking water is provided to 50–95% of the urban population, depending on the urban center. Once water quality is taken into account, the effective provision of safe drinking water falls below 50%. This is in part because a large part of the country depends on the heavily polluted Aras and (especially) Kura rivers for supplies.[35] The waters of the Kura do not meet existing drinking water standards, even after treatment. With surface water in poor shape, greater use of the country's groundwater resources is seen as a necessity. However, no clear policy has been formulated on new use of groundwater, although the importance of the topic is clear to many. Groundwater pollution from oil spillage and leakage from pipeline and storage tanks becomes of particular concern in this context.

Only 16 out of the most important 75 towns have wastewater treatment facilities. All were constructed during the Soviet era and most are in a poor state of repair, some are not functional at all (ADB 2004a). About 78% of the population of the Absheron Peninsula is connected to a wastewater collection system. In Baku, the construction of the sewerage system started in the 1970s and was to be finished in 1980, but the sewerage system for half of the settlements and districts of the city has not been completed.

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[33] Figures as high as 1.5 million hectares of land affected by salinity (i.e., area in excess of total irrigated land) are sometimes quoted.

[34] No benefit-cost comparisons of relative countering different types of land degradation have been attempted in Azerbaijan so far, however.

[35] Baku presents a more complex picture. The history of efforts to provide Baku with adequate water goes back to 1870's. The decision to build a canal supplying water from the Caucasus foothills to Baku was taken in 1899. The pipeline (Shollar-Baku) was finally opened in 1917 with financing by the Czarist government and a local oil baron Taghiyev. By now, Baku receives potable water from four sources: Shollar, Khachmaz and Kura water pipelines, and the Jeyranbatan water reservoir. The first two provide water from artesian wells of a quality superior to the other two.

Furthermore, the system[36] operates at 60% of capacity. About 400,000 cubic meters of untreated wastewater is discharged, primarily to the Caspian Sea. Some untreated water passes into Absheron lakes that are periodically pumped into the wastewater collection system, as constantly rising levels pose a threat of flooding of nearby areas (Mamedzadeh and Nimer 1999). The Kura River, too, bears a heavy burden of untreated municipal wastewater disposal.

Water tariffs for municipal consumers have existed since 1982, their level and collection falling well short of the cost of water and wastewater treatment provision,[37] households cross-subsidized, and collection rates low. Between them, the Water Code and the 2000 Law on Water Supply and Wastewater place the responsibility for water supply and wastewater treatment on *vodokanals* (municipal water service companies), giving these enterprises a degree of operational independence. For now, water supply and wastewater treatment are separated in Baku, the former having an area structure (Absheron Regional Water Company). Further institutional developments in the sector are underway.

Industrial Wastewater Discharge. The untreated or partly treated water discharges by the petrochemical and chemical industry have always been at the forefront of concerns. The degree of water reuse by the industry has declined in the postindependence period, as funds for maintenance of the functioning units further declined. Mixing industrial with municipal wastewater prior to treatment in the locations with wastewater treatment plants is common. Elsewhere, the wastewater is pumped directly into the sea or storage lakes. The pattern found in many FSU countries, namely reduced total volume of discharges but poorer performance by individual facilities, is very much in evidence in Azerbaijan.

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[36] Hovsan biological treatment facilities, with a capacity of 600,000 cubic meters per day and a project capacity of 940,000 cubic meters per day; Haji Hasan mechanical treatment facilities, with a capacity of 18,600 cubic meters per day; Shuvalan mechanical treatment facilities, with a capacity of 18,600 cubic meters per day ; Zikh mechanical treatment facilities, with a capacity of 126,000 cubic meters per day; Karadag biological treatment facilities, with a capacity of 17,600 cubic meters per day; and Khatai mechanical facilities, with a capacity of 258,400 cubic meters per day.

[37] The basic rate for households in Baku-Absheron of AZM185 per cubic meter contrasts with rates twenty times higher in European Organisation for Economic Co-operation and Development countries.

The policies in the sector combine MENR-administered pollution permitting, embodying an emphasis on end-of-the-pipe treatment,[38] water use and discharge inventories by individual sources, ambient standards, and an effluent charge system (elements of which were introduced during the Soviet era but with the system modified since).

C. Land and its Degradation

Most postindependence assessments dwell on the shortage of land in Azerbaijan (0.2 hectares of arable land and 0.6 hectares of agricultural land per capita), but this seems more a legacy of comparisons within the FSU and a reflection of the recent loss of the Nagorno-Karabakh territory rather than a sober identification of obstacles to progress. The high urbanization rate largely offsets the topographical constraints (that make approximately one third of the country's land unsuitable for agriculture) and lessens the land shortage. In any event, the crux of the problems is not shortage of land but its poor use, with advances nullified by fresh degradation.

The existing land use is given in Table 4. The overall totals, however, hide the qualitative changes within each principal category.

Losses of land productivity and functions go well beyond those mentioned earlier in connection with weakened irrigation management. There is, first, the urban and periurban wasteland, consisting of official and unofficial waste landfills and also abandoned infrastructure (warehouses, disused railroad tracks, rusting factories of all kinds, and others). The total of such land is not known exactly, though figures (poorly explained and documented) ranging from 20,000 hectares to 118,000 hectares can be found (Appendix 4). The existence of such land is obvious to even a casual visitor. Striking in parts of greater Baku and its abandoned oil fields, it is found in different guises in many other parts of the country, as if challenging the mantra of land shortage. It is an indication that management of urban and

[38] The permits, specifying permissible discharges, are developed by each enterprise and approved by MENR. They are issued for 3 years. Permissible discharges are reviewed every 5 years and may be changed in accordance with technological developments and changes in the environment. Pollution reporting is in the first instance the responsibility of the enterprises themselves. Where the enterprise does not have approved permissible discharge, all discharges are considered to be above the standard and either taxed at up to 1,000% of the rate applying to permissible discharge or the enterprise may be forced to suspend its operations. In preparing this analysis, no systematic assessment was made of how the theory squares with new practices. The Government's critics allege huge discrepancy between the two.

Table 4: Azerbaijan's Land Use
(2003)

Area	Hectares ('000)	Percent of Total
Total Land Area	8,641	100
Utilized Agricultural Area	4,745	54.9
Irrigated Land	1,450	16.8
Perennial Crops	176[a]	2.1
Pastureland	2,467	28.9
Other Agricultural Land	652	7.1
Forest Land Area	1,037	12.0
Water Bodies	398	4.6
Other Land Area	2,461	28.5

[a] 2001 figure.
Sources: State Statistical Committee and Food and Agriculture Organization.

commercial land lags behind the advances made recently in the management (titling and registration) of arable land.[39]

Soil Erosion. More than 60% of the country's territory is already exposed to erosion processes of various intensity: 16% is said to be subject to strong erosion, 15% to average erosion, and 31% to some erosion. Up to 80% of the mountainous area and more than 45% of agricultural lands are affected. The rate of soil erosion in hilly areas averages 100–500 cubic meters per hectare annually. The role of anthropogenic factors (farming on sloping land, and others) in the destruction of topsoil is high. Wind erosion mainly occurs in the country's coastal area, at the Absheron Peninsula, and the southeastern part of Shirvan. The area of mudflows and landslides covers 310 square kilometers and 420 square kilometers, respectively. On average, more that 1.5 million cubic meters of fertile lands are washed out by mudflows annually. Attempts started during the Soviet era to use such lands,[40] but the activities were discontinued after independence. A national program for soil conservation is being developed by the Soil Conservation Commission under MENR, jointly with the work on pasture degradation.

[39] Besides being affected by widespread flouting of zoning and other rules.
[40] Through a process known locally as *kolmatazh*. This Franco-Russian term refers to a mechanical removal of larger stones from the alluvium and control of the land's porosity.

Pasture Degradation. The conditions of pastures have suffered as a result of a temporary (and continuing) inability to replace the largely disciplined use of that resource (especially the pattern of summer-winter pasture rotation) during the days of collectivized agriculture. Unlike arable land, pastureland continues to be predominantly owned by the Government, with only about 10% controlled by rural municipalities. Yet, an effective mechanism of regulating and controlling the use of this resource under private ownership of the herd has not emerged. The control of stocking density is poor, and winter pastures are visibly being degraded.[41]

Military hostilities in Nagorno-Karabakh resulted in an influx of refugees and their animals into the central regions of the country, where overgrazing is particularly serious.

The Government is increasingly concerned by the situation. The May 2004 Presidential Decree 222 introducing the State Program on Prevention of Desertification, Efficient Utilization of Hayfields and Summer-Winter Pastures is too general, however, and unlikely to change the situation until specific mechanisms of improved pasture management and the right mix of incentives and disincentives are developed and introduced.

Forest Depletion. This topic is briefly reviewed in this section, rather than further below, as an aspect of threats to ecosystems and biodiversity. That, however, is more a matter of convenience. Technically, forest depletion is typically an aspect both of productivity loss and ecological impoverishment, the two linked in complex ways.

The spatial distribution of the 1 million hectares or so of forests (1.2 million hectares in 1984)[42] is very uneven in Azerbaijan, with 48.8% of the country's forests in the Greater Caucasus, 34.2% in the Lesser Caucasus, 14.5% in the Talysh mountains, 2.5% in Kura-Aras lowlands, and about 0.5% in Nakhchivan. It is in the lowlands where trees are conspicuously absent, including on the banks of the Kura and Aras, where trees once helped stabilize the river channels and control salinity.

There has been a rapid increase in the legal and illegal production of fuelwood since independence, coinciding with a decrease in the supply of electricity, natural gas, and other types of fuels (bituminous coal and kerosene) to smaller towns.[43] In the mid-1990s, these shortages affected

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[41] If the determination of pastureland's carrying capacity was crude in the Soviet days (four sheep or one cow per hectare), it hardly features in the existing practice now.

[42] The reliability of the figure of 1 million hectares today deserves to be questioned. As always in similar circumstances, the answers will be influenced by the definition of forest or forested land.

[43] Some 250,000 tons of coal were delivered each year to these locations.

perhaps half of the country's population, and the situation has improved only slightly since. Fuelwood production (now estimated at between 1.8 and 2.5 million cubic meters per annum) is three to four times that of the final years of the FSU. The authorized timber cut runs at about 60,000 cubic meters per annum, and the illegal harvest is about two thirds of this level. The pressure on forests' non-timber resources (berries, mushrooms, and medicinal flora) also increased at a time of sharply reduced employment opportunities. The substantial loss of administrative control over livestock has led to encroachment of forest lands for grazing and serious degradation of forest resources in a number of areas, especially the lower mountains. The annual reforestation targets set out in the State Program for Restoration and Expansion of Forests 2003 (some 64,000 hectares to be reforested by 2008) are unlikely to be achieved under the existing approach and levels of funding. Except for technical collaboration and training offered by Turkey, no development partner assistance has targeted the forestry sector.

D. Vulnerability to Natural Risks and Disaster Management

Attention to natural hazards and emergency preparedness is increasingly recognized as an important component of sustainable development. ADB's recently updated policy on disaster management bridges ADB's own experience in disaster-related assistance with the worldwide recognition of the topic's importance and the methodological and policy advances made by international organizations and local bodies.[44] Azerbaijan may not be as vulnerable to the vagaries of nature as some other FSU countries, most notably Tajikistan or, further afield, Mongolia, but all countries of the Caucasus, Azerbaijan included, feature young geology and wild fluctuations of rainfall that, together, result in high incidence of flash flooding and mudslides. In Azerbaijan, such events occurred on a major scale in 1995, 1997, and 2003. They displaced thousands of people along the Aras and Kura rivers and caused major infrastructure damage. Similarly, avalanches have affected life and property at various times in the country's mountains (Talysh in 2000/2001, for instance). Furthermore, like its trans-Caspian Central Asia neighbors, Azerbaijan lies in an earthquake-prone zone. No major earthquakes were reported during the last two decades, but

[44] ADB 2005b contains an extensive list of the most important documents and information sources related to the topic.

smaller earthquakes have occurred, affecting, for example, production from oil fields (increasing the oil debit from wells) and potentially adding to the risk of oil spills.

Qualitatively different from rapidly occurring natural phenomena are the effects of the changes in the level of the Caspian Sea. These may well be natural (a proposition periodically questioned), but they occur slowly and therefore call for a nonemergency type of response. Such a response will be different from an emergency response but not unimportant because of it and will focus on elements such as zoning of economic activities, choosing facility sites, and designing structures.

If this analysis does not place Azerbaijan's territorial dispute with Armenia and the political instability in parts of the Caucasus, in general, at the top of risk and vulnerability considerations, it is to retain the analysis's apolitical tone. Even that may be difficult, however, for the refugee emergencies, of which Azerbaijan has had more than its fair share in the aftermath of the war with Armenia,[45] often evolve into more permanent environmental and health challenges (e.g., additional pressure on pasturelands; increases in infant, under-five, and maternal mortality; mine-related accidents, and others), to say nothing of the humanitarian aspects of the situation.

The 2005 World Food Programme Food Security and Nutrition Survey found that 400,000–600,000 rural Azerbaijanis face food insecurity and nearly 300,000 of the nearly 1 million people displaced by the conflict over Nagorno Karabakh are likely to continue to rely on food aid for the foreseeable future. Since leaving Nagorno Karabakh 12 years ago, many displaced families still live in substandard conditions, especially in the mountainous regions of Lenkaran Astara in the south and Ganja Gazakh in the west. Only 40% of the households covered by the World Food Programme survey had access to agricultural land, and in all instances most of the produce grown was for family subsistence. An overwhelming majority of those affected depend on the Government's monthly allowance of $6, and nearly 90% purchase food on credit or borrowed money. Despite receiving food aid, the bulk of additional expenditures are on food or medical care, and more than half of the families have at least one member suffering from a chronic illness. It is clear that in these conditions, sustainable use of common natural resources is an intractable problem.

[45] The refugees or IDPs are not only Azeris. Azerbaijan has seen significant influx of the Chechens after 2000, Afghans, and others. Unlike the Azeris from Nagorno-Karabakh, the non-Azeri refugees receive no government support and overwhelmingly rely on international charity.

The United Nations Children's Fund's recent survey for the Extended Program on Immunization, targeting respiratory conditions and parasitic infections in Azerbaijan, indicates a lowering of coverage in general in Azerbaijan, but especially among IDP and refugee populations. The incidence of iron deficiency disorders is high, and salt iodization remains below 50%. Malaria is a new problem.

The previous two paragraphs–as well as several others dealing with topics such as exposure to toxic waste, shortages of winter electricity, or periodic breakdowns of water supply–suggest that vulnerability in Azerbaijan has several dimensions, some of which (e.g., supply of winter energy) are part and parcel of economic underdevelopment and as such are subject to standard remedies, while others (refugee-related problems or natural catastrophes) demand special approaches and their effective integration into the economic mainstream.

The Government's disaster management-oriented structures include the Emergency Response Center of MENR, Seismology Center under the Academy of Sciences, State Committee for Land Improvement and Irrigation (dealing with various aspects of flood control), and State Emergency Commission. Contacts are maintained between these bodies and the international partners specializing in emergency relief (International Federation of Red Cross and Red Crescent Societies, United Nations Children's Fund, United Nations Development Programme, United Nations Population Fund, World Food Programme, World Health Organization, and others).

Azerbaijan is home to the biggest astrophysical observatory in the Caucasus (in Shemakha). A national disaster preparedness and management plan, now under preparation, is to be the culmination of United Nations Development Programme and Shell Corporation assistance that started in 1999. Eight regional disaster management training and operational centers have been established, and foundations have been laid for establishing a countrywide emergency communications and warning system and a geographic information systems-based computerized database of disaster management resources and hazards.

E. Threats to Protected Areas and Elements of Ecosystems

The 2000 State of Biodiversity Report (United States Agency for International Development 2000) and the Draft National Biodiversity Action Plan provide a comprehensive view of the situation. The Caucasus has been identified by the World Wildlife Fund as one of key global ecoregions, based

on criteria such as species richness, level of endemism, and taxonomic uniqueness. Conservation International (2003) designated the Caucasus as a global hotspot (one of the 25 biologically richest and the most endangered terrestrial ecosystems in the world).

That richness has been recognized for some time. The first reserves, in Azerbaijan-Gey-Gel, Gizil-Agach, and Zakatala, were established in the 1920s. Later on, the Girkan and Turian-Chay reserves were set up. In the late 1950s, a further seven reserves were established:[46] The current total is 14 state reserves, with a total area of 191,200 hectares (2.2% of the country's total territory). In addition, 20 protected areas,[47] with a total area of 260,000 hectares exist in Azerbaijan. The first among the latter group was established in 1923 (the Kara-Yaz-Akstafa), the last in 1993 (Gabala). Protected areas supplement the reserve system. Together, these areas contain all main natural and climate landscapes. In addition, Azerbaijan boasts an unusually high number of recreational areas, typically centered on mineral springs and thermal waters and featuring medicinal and therapeutic facilities.

The biological resources of Azerbaijan are considerable. Several species counts and assessments have been prepared, the recent ones under the Convention on Biological Diversity.[48] The flora of Azerbaijan is said to contain about two thirds of all Caucasus species and exhibit a high degree of endemism (about 7% of all species are endemic to Azerbaijan). Certain unique features of fauna exist, too. The Caspian Sea has a high number of endemic aquatic taxa, with a large number of anadromous fish. The sturgeon is the best known among them. A great deal of specialized biological know-how and a body of Soviet-era research can be drawn upon.

For a long time now, the biological wealth of the country has been under threat from a number of anthropogenic factors: shrinking of natural landscapes and, with this, geographical diversity of species' habitats;[49] habitats' contamination; changes in the hydro geological, hydro chemical, and biological regimes of reservoirs and reduction in their surface areas; and pollution of water bodies. The last-mentioned provides an almost

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[46] Appendix 6 contains the full list of state reserves and protected areas.

[47] A state protected area is a temporarily protected natural territory or water area on which certain species of animals and plants, geological objects, elements of landscape, and others, are preserved, while forestry, agriculture, and other practices are allowed, usually for a specified period of time.

[48] Fifty-four species of reptiles, 14,000 species of insects, 99 species of mammals, 123 species and subspecies of fish, and 360 species of birds. The country's flora is particularly rich in vascular plants and fruit trees.

[49] It is only fair to add that the near abandonment of many irrigation canals and lands has created almost ideal conditions for certain forms of life, in particular birds.

textbook example of externalities so important to environmental policy: The hydrological works on the Kura River and the river's pollution have dramatically altered the conditions for the ichtiofauna dependent on that river (in particular sturgeon and salmon). The commercial catch of sturgeon has declined from around 10,000 tons in the 1960s to about 1,500 tons today. Some other fish species have almost or totally disappeared.

Recreational facilities have suffered, too. Their financial neglect during the early years of independence and the use of many of them as temporary homes for Nagorno-Karabakh refugees have created special problems. Some of the facilities have now been privatized and show signs of renewed vigor.

F. Safeguarding Cultural Heritage

The territory of the Southern Caucasus has been inhabited from time immemorial. The history of people settling this region has left its traces in many parts of the Caucasus region, including the present-day Azerbaijan. The state of this heritage in part reflects the economic fortunes of the country (funding scarce during the turbulent initial years of independence) as well as the progress in creating new ways of safeguarding it, adapted to recent changes of the Azeri society. Ecotourism and cultural tourism could play a positive role in Azerbaijan's development. Conservation of cultural heritage has attracted funding from unexpected sources, including in this case, the World Bank.[50] An interesting initiative has been the Development of Eco Agro-tourism in the Southern Caucasus project. This multiagency subregional undertaking is led by Eurasia Foundation and it promotes cultural and ecological tourism in the region and the development of rural communities hosting the cultural and ecological sites.

G. Regional Environmental Concerns

Caspian Sea. Regional environmental issues can be conveniently divided into two groups: (i) those relating to the Caspian Sea and (ii) those linked to transboundary river flows. As to the former, largely because of the activities of the Caspian Environmental Program, there is a good and growing understanding of the main issues. The Caspian Sea, now at 27.5 meters

[50] Cultural Heritage Support Project, International Development Association Credit 3207, implemented since 2002.

below the median sea level, the former figure famously fluctuating,[51] and with salinity of about one third of the world oceans' average, sits atop a huge reservoir of hydrocarbon resources, but it and the foreshore areas are also home to considerable biological and recreational resources and large populations. Its fate is linked to the flow of the Volga, the level of anthropogenic activities in and around it, and a number of other phenomena still poorly understood. The principal problems are (i) overexploitation of biota, especially commercial fish species, most notably sturgeon; (ii) damage to coastal habitats, infrastructure, and amenities, in part related to fluctuating water level; (iii) degradation of coastal landscapes; (iv) threats to biodiversity; (v) overall decline in environmental quality, linked first and foremost to municipal and industrial discharges; (vi) threats to human health; and (vii) contamination from oil and gas operations.

Of these the second problem shall be briefly commented on.[52] The post-1977 rise in the level of the Caspian Sea damaged the infrastructure built during the preceding period on the expectation of the sea's further decline. It also upset a seemingly robust prediction of a further sea decline, based on similarities with the Aral Sea, its declining level clearly linked to increased anthropogenic water consumption in the basin, as was also happening in the Caspian Sea basin. At present there is no widely accepted theory of the sea-level dynamics in the Caspian and as a result no government or pan-Caspian program on the prevention of the consequences of sea-level variation. This is so despite significant advances in subregional environmental cooperation spearheaded by the European Union, Global Environmental Facility, United Nations Development Programme, and World Bank, in the form of the Caspian Environmental Program. The recently (November 2003) signed Convention for the Protection of the Marine Environment of the Caspian Sea (Teheran Convention) commits the signatories with $6.5 million funding by Global Environmental Fund– to five objectives: (i) implement agreed-upon approaches to minimize transfer

[51] From 1901 to 1977, the sea level fell and the sea's area declined from almost 450,000 square kilometers to 370,000 square kilometers. This led to increasing development of the coastal territories and construction of new facilities, such as berths, coast-protecting darns, channels, roads, recreation facilities, and others, based on the forecasts for further decreases in the sea level. By 1977, the level had fallen from 25.6 meters below median sea level recorded in 1925 to a critical, by ecological standards, level of 29.0 meters below median sea level. At the time, the process was considered irreversible, and great losses to the economy were predicted. However, in 1978, a backward cycle started, and during the period of 1978–1995 the sea level increased by 2.3 meters, up to 26.5 meters below median sea level. An uncertain forecast is now for a further increase in the sea level by another 0.5–1.5 meters by 2010.

[52] The Caspian Environmental Program (www.caspianenvironment.org) provides extensive discussion of all seven concerns identified.

of invasive species from ship ballast water to the Caspian Sea; (ii) develop regional strategies for pollution reduction, including remediation of pollution hotspots and a program to dispose of stores of banned agrochemical products in accordance with the Stockholm Convention on Persistent Organic Pollutants; (iii) promote environmentally sound agricultural practices in the region, including appropriate use of agrochemicals and harmonization of water quality networks; (iv) reduce risk of pollution disasters and improve response capacity through the signing of a regional agreement on oil spill response, updating of the mapping of sensitive areas of the Caspian, assessment of risks for oil and hazardous substances, and development of a regional agreement on minimum standards of maintenance of the existing Caspian tanker fleet; and (v) develop new legislation relating to the convention. All of these are worthy objectives that wisely (based on not so distant experience) do not link domestic, economic, and environmental decisions to observed changes in the Caspian Sea's level.

Transboundary Rivers. All major rivers in Azerbaijan (Aras, Kura, and Samur) originate outside the country, and efforts to improve their quality have become a complex mix of imported problems and domestic weaknesses in protecting water quality. The level of discharges of heavy metals and other pollutants into the Kura and Aras in Georgia and Armenia is a subject given much prominence in Azerbaijan, and this is rightly considered a topic of major public health and geopolitical significance. As such, the problem attracts considerable development partner attention (Appendix 9).

Institutional and Policy Framework in Azerbaijan's Environmental Management

A. Legislative and Regulatory Development

The Constitution of Azerbaijan, adopted in 1995 and amended in 2002, enshrines the right of citizens to a healthy and clean environment. The Constitution also outlines the division of environmental responsibilities between central and local bodies. The 1992 Law on Environmental Protection and Utilization of Natural Resources introduced, among other things, the polluter-pays principle, opened the door for the use of economic instruments, envisaged the bridging of the gap between existing end international environmental standards, and enhanced the role of public awareness. Activities gathered pace with the political stabilization after 1995. The most important environment-related pieces of legislation since then are listed in Appendix 5.

The Law on Environmental Protection and the Law Environmental Safety of 1999 are central. Among other provisions, Chapter 7 of the Law on Environmental Protection defines the practices and procedure of conducting environmental expertise.

Appropriately, the new legislation has a framework character, and its effectiveness depends on the quality of implementation rules and regulations.

The almost automatic presumption that a new law has to be an improvement over the old one tends to be justified in FSU countries, simply because the new socioeconomic reality is so different from the old one. However, transition economies offer a very large number of examples where new laws were constructed and drafted poorly, or, finally, where the speed of change in underlying conditions surprised the legislative framers. Some laws then become dated very quickly, requiring amendments, too many of which add to a sense of legislative and regulatory flux, with its drawbacks.

Some of specific shortcomings of the legislative framework include the following.

Substantial Overlap between the Law on Environmental Protection and Law on Environmental Safety. The existence of the two laws side by side offers few advantages, while making the legal framework unnecessarily cumbersome. Assignment of liability for pollution-related damage in the Law on Public Health that substantially duplicates the polluter-pays principle provisions of the Law Environmental Protection and is in partial conflict with the remainder of liability legislation (Administrative Code and the Law on Mandatory Environmental Insurance)

Legislative gaps that include, for example, procedures and responsibilities in cases of environmental emergencies, such as oil spills, the whole field of hazardous waste management with environmental liability provisions, and the management of the coastal zone, especially provisions concerning water-protection and land-use measures.

Absence of Specific Legislation Governing Environmental Assessments. The Law of Environmental Protection defines state environmental expertise and its scope without, however, containing clear criteria for inclusion or exemptions of activities and projects from state environmental expertise. The distinction between state environmental expertise and environmental impact assessment (the latter a subset of the former in Azerbaijan) is at odds with international practice and creates unnecessary confusion in circumstances where so much of environmental management in the country is financed by foreign sources.[53]

Disproportion between the obligations placed by the Land Law on municipalities to protect land under their jurisdiction and the ability of the municipalities to respond (requiring unambiguous delineation of this land).[54]

Absence of Contemporary Legislation Relating to Emergencies and Disasters. The existing legal framework (and institutional arrangements) continues to be based on Soviet-era civil defense legislation that is increasingly out of tune with the structure of the nation's institutions and the functioning of the country's economy.

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[53] Environmental impact assessment is conducted by a project sponsor, based on 1996 State Committee for the Environment's *Handbook for the Environmental Impact Process in Azerbaijan.*

[54] For others, MNER among them, however, the problem is seen more as one of municipalities' legal claim to natural resources outstripping their ability and willingness to manage those resources in a sustainable manner.

At the level of detailed regulations, a number of instances can be found where Soviet-era regulations–many developed in 1960s and 1970s and overtaken by technological changes and new public health findings–uneasily coexist with new ones,[55] the treatment of emission standards is the best known. Though simple in principle, the conversion of Soviet-era standards to internationally prevailing benchmarks (such as World Health Organization standards) is a time-consuming and relatively costly undertaking. The methods of calculating environmental damage and compensation, to give another example, are inconsistent at the level of detailed regulations. Elsewhere (e.g., Law on Industrial and Municipal Waste), it is a downright absence of detailed regulations so far that lowers the effectiveness of the law.

In general, development partner assistance rarely touches the unspectacular but essential component of regulatory development and its internal reconciliation. Important to acknowledge, however, is that legal and regulatory development is a never-ending work in progress. The difference between properly functioning regulatory provisions and practices and undeveloped ones is clear even to a nonspecialist, but only the inexperienced will wait for the day when everything is in place.

Azerbaijan's Partnership and Cooperation Agreement with the European Union of 1999, speaks of Azerbaijan's intention to emulate European Union environmental legislation as well as developing strategies to deal with global environmental issues and sustainable development. It considers the development regulations to European Union standards a tool of sustainable development. This is useful in that it offers a clear vision (as well as a body of examples) that can be followed. These and similar partnerships[56] are likely to contribute to the process of regulatory and standards' reform not unlike similar developments in European Union accession countries prior to 2004.

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[55] The Law on Normative Legal Acts, adopted in the immediate aftermath of independence, sensibly provides for continued validity of Soviet-era legislation in all cases where this legislation is not in conflict with the Constitution.

[56] ADB (2004a) gives the example of the World Health Organization-driven European Plan of Actions for Environmental Protection and Children's Health. Now signed by Azerbaijan (June 2004), it places on the Government certain obligations with respect to modifications of standards and legal frameworks in the area of water supply and sanitation.

B. Environmental Policies and Their Evolution

The World Bank-assisted NEAP 1997 was perhaps the first serious attempt to go beyond merely listing project proposals and including elements of analysis, justification of approach, and hints of needed policy reform. The NEAP prioritizes environmental problems into 32 objectives organized into five groups of actions (Appendix 1). All actions are assigned to a specific government agency. Only a small share of actions envisaged in the NEAP for the period 1998–2003, however, has been implemented.

The NEHAP was unveiled by the Ministry of Heath in 2001, offering an approach to environmental management based on health considerations, rather than mainly ecological ones, which was the hallmark of State of the Environment reporting (of which Azerbaijan's was completed in 1998) and, to a lesser extent, NEAP reporting.

The State Program on Poverty Reduction and Economic Development (SPPRED) 2003–2005, developed by the Ministry of Economic Development, acknowledges the many links between poverty and environmental conditions and proposes to use government funds in targeted pursuit of sustainable development. It echoes the priorities of the NEAP (e.g., decontamination of land, treatment of hazardous waste, development of renewable energy, and protection of fish stock in the Caspian) and adds to them (e.g., supporting tree planting and waste recycling, calling for improved environmental monitoring of projects by communities and municipalities, providing better equipment for regional environmental laboratories, and enacting further administrative reforms).

SPPRED is silent on how MENR and others should develop these activities and (unlike the NEAP) on how they should be financed. Partly in order to overcome this omission and to ensure continuity with the NEAP, MENR formulated (in 2003) the SPESSED 2003–2010. The SPESSED addresses the principal dimensions of sustainable development, contains a time-bound plan of action, and gives MENR the primary role in guiding the implementation but envisages involvement of mainstream economic agencies in that process. At the same time, the various activities contained in the SPESSED have not been sufficiently developed, let alone subjected to a cost-effectiveness or benefit-cost analysis, as done (admittedly on a limited scale) in the NEAP.[57] That essential step (the NEAP II) is therefore

[57] As it is, as pointed out in ADB 2004b, paragraph 83 of the SPESSED fails to securely prioritize within sectors. In the water supply and sanitation sector, for example, SPESSED favors new technologies of water reuse over rehabilitation of existing facilities, which not even mentioned in the plan seemingly without any comparison of the economic merits of these (and other) approaches.

yet to be taken and its best form should feature in regular government-development partner dialogue.[58] Two interministerial working groups have nevertheless been created to coordinate SPESSED activities concerning water supply and sanitation and municipal waste management, respectively, perhaps as a precursor to the necessary development of the SPESSED's specifics.

The State Program for Restoration and Expansion of Forests 2003, approved simultaneously with the SPESSED, though not developed through the same process, proposes activities in 10 subsectors, together with financial sources and performance indicators. The prospects of the State Program for Restoration and Expansion of Forests and its implementation will depend on the evolving balance between development partner support in the area of natural resource management–heavily leaning in the direction of conservation–and domestic perceptions of how best to combine forests' productive and other functions.

Important policy developments have taken place also under the Caspian Environmental Program. The coastal zone of Azerbaijan, as defined under this program, happens to be the populous and industrial part of the country, and policies developed under this program are therefore of national importance. The two documents finalized last year include the National Caspian Action Plan[59] and the Caspian Strategic Action Program.

Among the weaknesses, the following have been mentioned.

Discrepancy between the Focus of Policy and the Scale or Nature of Problems. The major shift in the origins of air pollution, from stationary to mobile sources, for example, has not been translated into increased attention to mobile sources. Elsewhere, the relative importance to be given to dealing with the legacy of past pollution versus dealing with new pollution has not been approached systematically. Despite efforts by several agencies to address some of the problems of multiple contamination of the Absheron Peninsula, no overall strategy of dealing with it exists, suggesting that optimum sequencing of activities and corresponding zoning, defining the role of financial instruments in assisting the process, implementing environmental liability rules, and others are needed. The extent to which a nationwide hazardous waste strategy, now under preparation, will lend itself

[58] World Bank has indicated its preliminary interest in supporting the NEAP II.

[59] The label *national* is not accidental. It is an indication of a more pragmatic approach to regional cooperation among FSU countries. Experience in Central Asia suggests that rather than regional action, newly independent states prefer regional consultation and national action. The same is largely true in the Caspian area.

to tackling concentrated problems such as those of the Absheron Peninsula remains to be seen.

Narrow Definition of Certain Environmental Problems. In the example of mobile source pollution given, the problem (where acknowledged) is cast in terms of polluting vehicles and sometimes leaded petrol but not also in terms of road accidents, congestion, and noise pollution. These are increasingly worrisome in Baku.

Questionable Basis of Policy Formulation. In some instances (e.g., water management), tradition has demanded that policy be developed in sector terms. This deserves to be questioned, as international experience suggests that river basins may be a more appropriate basis for policy formulation. Here, policy development lags behind the intent of the 1997 Water Code.[60] As it is, a water development strategy in Azerbaijan, based on comparative cost analysis (or even better, benefit-cost analysis), and containing specific targets and implementation dates, is yet to be adopted (World Bank-financed early support for this notwithstanding). Similarly, there has been little discussion of the merits and disadvantages of different approaches to pastureland and state reserve land management (e.g., partial privatization of the latter).

Unclear Relationship between the Approach and Objectives of the National Environmental Health Action Plan and State Program for Environmentally Sustainable Economic Development and the status of the National Environmental Health Action Plan and the Degree of the Government's Commitment to it. This is most noticeable in the plans for air quality management, where three different visions exist, namely those initially charted by the NEAP, which were put forward in SPESSED, and finally a detailed strategy contained in NEHAP. In the same plan-proliferation vein, the Ministry of Economic Development's 2004–2008 country development plan is expected to present yet another approach to development of sectors with important environmental ramifications, such as water supply and sanitation and possibly air-quality management. There have been some successes, too, the experience of SPPRED formulation among them. Sector working groups established (including nongovernment and civil society organizations) complemented by a secretariat supported by foreign experts within the Ministry of Economic Development to

[60] ADB's Supporting River Basin and Flood Management Planning (Technical Assistance 4301-AZE) and the United States Agency for International Development's Water Management in the South Caucasus project were early attempts to reorient the approach to water management.

coordinate the work of sector working groups as well as facilitating the participation and contribution of international development partners in the process. Policy measures were checked for consistency with the available sources of finance, all proposed items of government expenditure were included in the Medium Term Economic Framework, and indicators for monitoring implementation were defined. Consistency with millennium development goals was confirmed.

Pricing of resources and environmental services continues to be an area where much additional work is needed. Many in the Government (mainly in the Ministry of Economic Development) are well aware of the nature of the challenge, and important decisions were adopted in 2002 to improve financial discipline in the energy and water sectors. The progress has been faster in the energy sector where European Bank of Reconstruction and Development-assisted comprehensive energy sector reform is acquiring the necessary building blocks (tariff regulation and a tariff board, monitoring and auditing of utilities, and others). ADB (2004a) describes the scale of the challenge in the water supply and sanitation sector. The effectiveness of pollution taxation in its present form would deserve a fundamental review. The cost of administering the system is greater than the revenue generated and, more fundamentally,[61] there is little evidence of any significant incentive effect. An integrated approach to transport management in Baku, with its important environmental dimension, is another area where policy development is badly needed, as is an integrated approach to tackling land degradation. In both of these cases, institutional factors (inexperience of the new Ministry of Transport in the former cases and overlapping responsibilities among four agencies in the latter) have contributed to the slowness of policy formulation.

In a number of cases, policy analysis is handicapped by the absence of relevant data (and an excess of much-repeated less relevant data). Poor knowledge of waste management streams is typical of this situation in Azerbaijan. The problem is often caused by lack of leadership. A long tradition of collecting data without asking hard questions about why they (rather than some other data) are being collected and not making data collection subservient to performance evaluation are part of the legacy that Azerbaijan needs to overcome. At the same time, new bad habits have cropped up, such as reluctance to share information across different government agencies.

[61] The purpose of pollution taxes is not to raise revenue but to reduce pollution. Similar to traffic fines, no or little revenue collection could be indicative of good performance by polluters (or potential traffic offenders), rather than poor enforcement. The cause for concern is therefore not the low revenue collection but the undiminished pollution.

Disaster preparedness is handicapped by the absence of policy in this area. At present, the State Emergency Commission operates on an as-needed basis, without a formal policy. This may not seem unreasonable, since emergency action is justified only by emergency circumstances, not otherwise. Nevertheless, by being only response-oriented, the structure neglects aspects increasingly recognized as vital to disaster management (i.e., various aspects of preparedness, incorporation of disaster management considerations into investment decisions, public awareness and others). The function of national policy on disaster management is precisely to say how the widening of disaster management from mere (even if vital) emergency response to overall preparedness is to be achieved. A disaster management policy and action plan is being prepared with United Nations Development Programme assistance.

C. Institutional Responsibilities

Development partners, especially UNECE, took note of the significance of the establishment of MENR in 2001 to succeed the former State Committee for the Environment, with an expanded mandate that now includes geology, fisheries, and forests. Broadly, MENR has a central apparatus, 21 specialized departments (including, among others, Caspian Environmental Monitoring, Department of Fishing Reproduction, Department of Forestry, Hydromet, State Environmental Inspection, and others); 5 subordinated research-oriented agencies, 29 regional environment and natural resource departments, 41 enterprises for forest protection and regeneration, 10 fish hatcheries, and 7 geological expeditions (essentially, prospecting and inventory teams). MENR current employs a staff of about 9,500 at the central and local levels.

MENR's responsibilities are no different from those found in other countries. They include (i) formulation and implementation of the Government's environment policy, (ii) development of environment protection measures, (iii) screening of new and existing projects for potential adverse environmental impacts (ecological expertise and environmental impact assessment), (iv) monitoring of enterprises' conformity with environmental legislation and imposing sanctions on errant enterprises, and (v) administering a pollution permit system. In addition, its forestry and fisheries departments are tasked with ensuring sustainable use of resources. MENR's responsibilities in the mining sector relate to exploration and mitigation of the effects of mining activities. At the local level, government environmental control is performed by environment and natural resource departments.

On the positive side, it is recognized and accepted in Azerbaijan that on its own, MENR would at best be able to affect areas such as nature conservation but not the big problems of waste management, decontamination, deforestation, and pasture degradation, to mention only the most prominent. Other government bodies play a major, even if indirect, role. The principal among them are

(i) Ministry of Agriculture, Ministry of Economic Development, Ministry of Education, Ministry of Fuel and Energy, Ministry of Health, Ministry of Interior, Ministry of Justice, and Ministry of Transport;
(ii) State Committee for Architecture and Construction;
(iii) State Committee on Land and Mapping;
(iv) State Committee on Land Improvement and Irrigation (from 2004, under the Ministry of Agriculture);
(v) State Committee on Statistics;
(vi) State Oil Company of Azerbaijan; and
(vii) State Traffic Police.

Each of these agencies has a unit (a department, division, center, or section) specifically charged with the environmental dimension of their activities, attesting to a deliberate attempt by the Government at environmental mainstreaming. Important also is the role of municipalities that are in charge of water supply and sanitation activities and land use decisions within their areas of jurisdiction.

The institutional pattern of environmental management extends in three other directions. At the level of legislature, the Parliamentary Standing Commission on Natural Resources, Energy and Environment is the official link between the electorate and the process of environmental legislation. The academic community, centered on the Azerbaijan Academy of Sciences has 34 (underfunded) institutes,[62] several of them with a long history of Soviet-era science and major scientific achievements but also a tradition of dealing with environmental problems in a way that is often incomplete or even inappropriate in the new circumstances. Nongovernment organizations complete the picture.

The management of natural risks and disasters is an area where further reforms are needed. The ad hoc functioning of the State Emergency

[62] The Azerbaijan Academy of Sciences website (www.science.az) has details about the work carried out by each of its 34 institutes.

Commission, created in 1995 to supplement the Civil Defense Board,[63] was mentioned earlier. This partly negates the commission's positive feature (i.e., its interagency character, confirmed by its subordination to the vice-premier).[64] As it is, there is no permanently functioning body in Azerbaijan dealing with disaster management, with the partial exception of MENR's Emergency Response Center, created only 2 years ago, in part to coordinate work on oil-related emergencies. Little if any contact exists between the center and the committee or the board, however. The management of disasters at the local level is driven by the local executive power (a governor). Governors are also responsible for the preparation of local contingency and response plans. These plans tend to vary in quality and completeness. Existing disaster management structures, especially the State Emergency Committee, have proven to react relatively slowly during recent emergencies (i.e., the floods of 2003), when the international community (International Federation of Red Cross and Red Crescent Societies , Medicins sans Frontieres, and others) was much faster in conducting emergency assessments, launching appeals for assistance, and delivering much of that assistance.

To say that many aspects of the institutional structure and functioning could do with further reform risks being trite. No institutional framework anywhere functions seamlessly. Elimination of overlapping responsibilities, in particular, is the bread and butter of most administrative reforms, and few such reforms succeed entirely. With that in mind, among the pertinent suggestions for the authorities' consideration have been the following.

Further Streamline the Ministry of Environment and Natural Resources. This is needed in particular in the case of monitoring, where three units (National Monitoring Service, Caspian Environmental Monitoring Department, and State Environmental Inspectorate) have overlapping or complementary (to the defenders of the status quo) responsibilities.

Eliminate the Duplication Found within Economic Sectors. In water management in the countryside, for instance, overlaps involving Ministry of Agriculture (State Committee for Land Improvement and Irrigation), MNER, and others exist, and in Baku, between Absheron Regional Water Company and Bakkanalizatsiya. Duplication of functions relating to water

[63] An element of Soviet-era institutional structure found in all FSU countries. Civil Defense Board combined a number of functions, some of a Cold War nature (readiness for a nuclear attack), others related to civilian emergencies.

[64] Department of Utilities and Construction attached to the Cabinet of Ministers is formally responsible for.

quality and monitoring (and medical and radioactive waste) between MENR and the Sanitary and Epidemiological Service of the Ministry of Health is another example, as are overlaps inherent in conservation legislation. The country's approach to dealing with desertification is hampered by an unclear mandate involving the Ministry of Agriculture (State Committee for Land Improvement and Irrigation) MENR, and SCSM. A somewhat uncertain assignment of responsibility exists with respect to some of the international environmental conventions (e.g., Convention on Biological Diversity with focal points in MENR and the Academy of Sciences).

Recognize Potential Conflicts of Interest. The merging of forestry and most of fisheries and mining with MENR has been positive in emphasizing these sectors' environmental dimension. However, the same institutional step introduced a conflict of interest between those whose job it is to conserve resources and those whose performance depends on how much is produced. Pasture management or timber may be a case in point. Here, the limitations of one particular variant of mainstreaming (i.e., creating an environmental unit within a production ministry) become apparent. The environmental section of, for example, the Ministry of Agriculture, need not be the best champion of sustainable farming.

Continue to Strive for a more Responsive Approach to Environmental Issues in the Countryside. The political decentralization that, in 1999, resulted in the creation of about 2,500 rural municipalities and about 200 town municipalities has not reached very deep. In practice, the balance between the local organs of the executive and elected local powers remains heavily skewed in favor of the former, despite formal allocation of many powers to elected local governments. This situation applies also to environmental management, where environment and natural resource departments and forestry enterprises subordinated to MENR make all important decisions and control funds. This constrains local environmental initiatives or emphasizes the technical element of environmental management at the expense of the democratic. Experience of Baku-Tbilisi-Ceyhan (pipeline) community activities, however, indicates that this may be beginning to change.[65]

[65] The community development program financed by the Baku-Tbilisi-Ceyhan (pipeline) consortium seeks to improve living conditions of communities located in the vicinity of the Baku-Tbilisi-Ceyhan pipeline, which is now under construction. The program is implemented by four international nongovernment organizations and includes components such as school and health posts' improvement, improved local waste management, and others.

Recognize the Need to Calibrate Institutional Responses to Existing or Emerging Environmental Problems. Institutional overlaps are symptomatic of superficial or no working relationships between (or among) the institutions concerned. In an interesting study of the effect of agricultural decollectivization on public health, Temel (2000) shows that in the absence of good cross-sector collaboration, the collapse of collectivized irrigation infrastructure became a major contributor to the recent resurgence of malaria transmission in Azerbaijan. Effective collaboration among agriculture, health, and environment ministries, as well as agriculture experiment stations, public health clinic, and local environment staff, was very slow in coming.

Adjust the Institutions In Line with Emerging Technical Consensus. The approach to water management in Azerbaijan's countryside, for instance, has been very much sector-based, rather than structured around river basins. The institutional dimensions of such a transition have not been systematically looked at so far.

D. Environmental Standards and Environmental Impact Assessment Process

Azerbaijan inherited the Soviet environmental review (environmental expertise) procedures, with a heavy emphasis on science and engineering and the socioeconomic factors, a given rather than a policy variable. The cowed public had little role to play in the process. A procedure fashioned after the international environmental impact assessment was developed in 1996 and applied to dozens of major developments, particularly in the oil sector. The resulting dual-track System (environmental expertise and environmental impact assessment[66]) has helped to bridge the gap between external pressures for establishing modern environmental impact assessment and the lack of internal capacity to do so in the face of political and economic challenges. The drawback is the system's nonmandatory character and associated potential irregularities in the application of environmental impact assessment and use of its findings. The success of the Azerbaijan model will

[66] To this day, it is hard to agree on a simple definition of environmental expertise. In principle, a panel of environmental experts can be asked to deliberate on any existing or new project or any existing or projected situation (ecological situation in the region, state of various natural objects, or others) having environmental dimensions. The scope of environmental expertise is therefore much wider that that of environmental impact assessment and on paper, at least, environmental expertise combines environmental impact assessment and strategic environmental assessment and offers a greater level of safeguards than procedures based on assessment only.

depend on whether the parallel environmental impact assessment system is capable of continuous improvement, integration with existing formal procedures (with environmental expertise being finally abandoned), and transformation into a mandatory environmental policy tool.

An excessive number of standards and emission levels was one of the hallmarks of the Soviet approach. At independence, nearly 500 emission limits and standards were set, easily outrunning the existing monitoring capacity (even before its near collapse in the immediate aftermath of independence), the scientific language and approach masking the absence of prioritization and compromises weakening the enforcement. Source-specific emission standards were added in the 1980s. Apart from their large number, most standards were adopted in the 1960s and 1970s. The plethora of existing standards hides their static character:[67] many of the existing standards no longer fit changed conditions of nature use and new knowledge about natural processes and impacts, while others, now widely used in advanced international practice, are absent from Azerbaijan for the time being.

In the Caspian transboundary context, most coastal countries (including Azerbaijan) are parties to the Convention on Environmental Impact Assessment in a Transboundary Context but joint or cooperative environmental impact assessments have never been conducted for transboundary projects (such as oil development projects or natural resource quota distributions among coastal countries). Indeed, none of the coastal countries has procedures for conducting an environmental impact assessment for transboundary projects. The environmental expertise procedures, on the other hand, are sufficiently similar in FSU countries, and as long as they remain a tool of policy (they should not, perhaps) this may facilitate joint action.

Individuals or nongovernment organizations are entitled to conduct nongovernment environmental assessments. In practice, this is rare, as it demands financial resources beyond the reach of most nongovernment organizations. Furthermore, the conclusions of nongovernment organization-sponsored environmental impact assessments have no judicial force. Under the decentralization policy of the Government, municipalities and communities are to be involved in environmental impact assessment of local economic development projects, although the mechanisms of such involvement have not been specified.

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[67] In theory, simplification is possible since standards of permissible discharges in Azerbaijan are reviewed every 5 years and may be changed in accordance with changes in technological processes and changes in the environment.

E. Environmental Monitoring

As in other FSUAs in other FSU countries of Asia and the Caucasus, there has been a significant decline in the level of ambient quality monitoring. At present, MENR's centrally managed monitoring network consists of 26 air pollution measuring stations, 29 water quality stations covering main rivers and Caspian coastal waters, 19 soil condition sites focusing mainly on industrial soil contamination, and the Central Analysis Laboratory. Parallel with this system, environment and natural resource departments perform their own monitoring (but former regional analytical laboratories are not functioning), as does Hydromet, the Ministry of Health, some research institutes, and the State Committee for Land Improvement and Irrigation. As for industrial discharges, monitoring depends in the first instance on the enterprises themselves. Environmental indicators are listed in Appendix 3.

As it is, many organizations monitor and most are underfunded. The problem is wider, and rather than simply restoring the level of monitoring activities to preindependence levels,[68] a reorganization of environment monitoring in Azerbaijan that would reduce the number of agencies involved and revise their mandates would deserve serious consideration. That such a task will face entrenched institutional interests is clear.

In several cases, there is an additional need to adapt the pattern of monitoring to improved knowledge of the nature of underlying problems. Dealing adequately with vehicular pollution, for instance, demands the knowledge of fine particle emissions and ground-level ozone that remain unmonitored in Azerbaijan.

Within MENR, efforts are being made to develop an environment database and make it more relevant to policy formulation, but here, too, the value of this effort is partly undermined by a faltering exchange of environment-related data since 1991. UNECE sees the development of protocols on data sharing obligations as a way forward.

F. Financing Environmental Management

The 1992 Decree No. 176 (Payments for the Use of Natural Resources and Environmental Contamination) marks the beginning of the use of

[68] The United Nations Development Programme Human Development Report 2003 paints an upbeat picture based on recent instances of partial restoration of the preindependence level of ambient monitoring. Whether looking at the decline since 1990 or concentrating on the successes of the last few years, most agree that there is room for substantial improvement.

environmental charges as a policy tool. The charging system has three tiers (within-permit, above-permit, and fines) with a different rate applying to each. In the case of air pollution, these are levied on a total of 88 pollutants. A location coefficient calibrates the level of charges to local ambient conditions. This is a sensible structure. However, the charges are too low to bring forth the desirable response (i.e., less pollution). The sulfur dioxide charge in Azerbaijan of AZM132 per ton ($0.03), for instance, compares with Poland's within-limits rate of $94 per ton, or even Russia's $1.2 per ton. Also, a variety of exemptions have been granted in practice by local authorities. Since 2001, the State Environment Protection Fund, formerly receiving the proceeds of pollution charges and fines, has been consolidated into the state budget and serves more as an accounting device.[69] However, the totals involved have been insignificant. The 2002 pollution revenue total of AZM1.1 million (about $250,000) compares with tens of millions of dollars in Hungary or the Czech Republic or $0.5 billion in Poland. No complicated assessment is needed to say that the charges have no incentive effect and at best are an inefficient tax-raising device. The yield of pollution taxes is dwarfed by environmentally important extraction taxes (oil and gas), excise taxes (automotive fuels), import (vehicles) taxes, and the land tax.

As in most ADB developing member countries, the calculation of environmental expenditures as a percentage of gross domestic product in Azerbaijan is of limited usefulness, because the most telling categories of environmental expenditure (e.g., those on irrigation and drainage, improved energy efficiency, and others) are usually not counted. With this major qualification in mind, the 2002 budget of MENR amounted to about AZM85 billion (about $18 million), or 1.80% of the total government budget in that year and 0.02% of gross domestic product.

The financing projections of documents such as the NEAP (Appendix 1) are a good reminder of the role other government agencies and foreign development partners and lenders play in helping put Azerbaijan on a sustainable development course. No widely agreed database of development partner expenditure exists in Azerbaijan (surely a major cause for concern) but the listing of this document (Appendix 9) suggests that the annual level of environment-related grant assistance–with all of its definitional uncertainties–was around $5–10 million in the last few years, while loan

[69] A development similar to that observed in many countries (most notably the People's Republic of China) where the earmarking of environmental revenue, once a source of much of environmental funding, ceased to be automatic. In Azerbaijan's case, about 90% of the funds collected by the State Environment Protection Fund returned to MENR in 2002.

assistance ran at about $30–50 million per year.[70] ADB's environmental management assistance is shown in Appendix 8.

G. Azerbaijan and International Environmental Agreements

Azerbaijan has quickly made up for the absence of independence in international environmental conventions prior to 1990 and has responded to virtually all the principal international and subregional agreements. These are summarized in Appendix 7.

Like other Central Asian developing member countries, Azerbaijan is at the intersection of European and Asian institutional sets. The country is a member of UNECE but also United Nations Economic and Social Commission for Asia and the Pacific, a member of European Bank of Reconstruction and Development and ADB, but also, for instance, the Black Sea Trade and Development Bank. Through its membership in the Caspian Environmental Program and the recent upsurge in oil and gas extraction activities in the Caspian Sea, it reaches to Central Asia. The pull of Europe is particularly strong, as witnessed in a stated intention to harmonize, in due course, its environmental legislation and standards with those of the European Union.

H. Role of Civil Society

A 2003 environmental nongovernment organization handbook lists 80 local environmental nongovernment organizations in Azerbaijan. These are, in addition to a number of international nongovernment organizations active in the country, typically implementing projects funded by bilateral development agencies (e.g., Adventist Development and Rural Assistance, Mercy Corps, and World Vision, with others implementing United States Agency for International Development community development programs, or organizations such as Eurasia Foundations or Initiative for Social Action and Renewal in Eurasia supporting the involvement of civic society in environmental matters). This is a relatively high number of nongovernment organizations relative to population in a country where most indices of

[70] With some hesitation, the figure is derived from the breakdown of the total debt of $1.5 billion, since 1991, by main categories of expenditure.

openness and freedom of expression are not favorable. The preparation of this analysis had the benefit a consultation with local nongovernment organizations. Among other things, this made it possible to appreciate their diversity, the strong presence of the academics in some of these (in part as a way of securing funds for applied science), their widely different levels of experience working with international partners, and the great deal of goodwill and grassroots experience they possess.

The Aarhus Convention was ratified in 2001, jointly with a number of UNECE countries. The convention has now come into force. The Aarhus Centre has been established within MENR in Baku. As in most other countries, compliance with the convention's provisions leaves considerable room for interpretation. The Government's recent mistrust of environmental nongovernment organizations may be easing. A press office was set up at MENR in 2001 to improve links with the media and nongovernment organizations.

Fundamental rights of individuals to contribute to environmental safeguards are proclaimed in law, and the obligation of project proponents to consult the public as part of the environmental impact assessment process is well established. Public hearings are being held, with meaningful participation by civil society. Nonetheless, full participation in the environmental impact assessment process is said to be hampered by the high cost to nongovernment organizations of acquiring complete information that would make it possible to challenge these assessments on technical grounds. Whether parallel nongovernment organization-led environmental impact assessments are desirable is, however, doubtful. More serious is the probably insufficient public scrutiny given to key strategic and policy documents. Some of these may well be drafted by nongovernment specialists (e.g., Academy of Sciences experts), but that is very different from giving a wide scrutiny to the documents produced.

Important to follow is the evolving role of local elected bodies in environmental management. Here, private sector experience (especially that of the Baku-Tbilisi-Ceyhan project's Community Development Fund) may point the way to unlocking the potential of local elected bodies for setting local environmental [and other] priorities and administering enabling funds).

In the Southern Caucasus, civil society can play a constructive (or disruptive) role in mitigating transboundary environmental and other problems. The need to harness the constructive element is well recognized by the international community that has funded several projects designed to facilitate contacts as a necessary step to resolving pending environmental issues. That the Eurasia Foundation's South Caucasus Cooperation Program was inaugurated in 1998 to facilitate greater contact and cooperation among

leading organizations in Armenia, Azerbaijan, and Georgia is an example of this approach. Transboundary water management is one area that has attracted significant funding aimed at involving the population at large.

I. Development Partner Assistance and Search for Greater Synergy

The international The international community has safely diagnosed the principal environmental problems in Azerbaijan, in most cases recognizing the degree to which a lasting improvement in environmental conditions depends on sustained reforms in the principal sectors of the economy. Appendix 9 summarizes development partner and international financial institution support since 1996 by principal categories, using ADB sector and thematic classification.

There has been a great deal of duplication in development partner assistance, especially at the level of introductory analysis and getting to know the country and its environmental problems. Indeed, the term assistance is probably misplaced in that context. That is not to argue that all duplication (and repetition) is bad, for some of it may well be the cement that contributes to a broad understanding of environmental policy and practice in the country.[71] This is particularly important in Azerbaijan, where no mechanism of development partner coordination in environmental matters exists. Neither the United Nations Development Programme, the usual coordinator, nor MENR have performed this function in Baku. The best form of such coordination is open to debate, and it may well be that coordination built around themes or subsectors and having a substantive technical content is more useful that a comprehensive but superficial accounting of who does what. Some of the former type may be emerging in the water supply and sanitation sector (ADB 2004a).

A review of what has been done in Azerbaijan presents a good opportunity to look again at the role the private sector can play as agent of change in the country's environmental management. A cynical view of that assistance would be inappropriate. Its innovative elements (e.g., British

[71] Other duplication, however, maybe just that (i.e., duplication). A single example will illustrate: The Cleaner Production and Energy Efficiency Center, established in 2003 with Norwegian funding, coexists with the Energy Saving and Management Center, founded only 3 years earlier with EU TACIS support. The former reported its early attempts to cooperate with the latter that failed. The decision to go its own way may have pleased the development aid administrators but is probably bad for the cause of energy efficiency in Azerbaijan (please refer to www.ensi.no for details).

Petroleum's funding for waste recycling and the Baku-Tbilisi-Ceyhan Consortium's implementation of community and environmental programs) should be studied and its best features introduced more widely.

As to the direction of future assistance by development partners, under its new country program for the period 2005–2009, the United Nations Development Programme proposes to support the design of a long-term program of waste management, management of international waters, implementation of the National Biodiversity Strategy, and fulfillment of Azerbaijan commitments to United Nations Convention to Combat Desertification as well as collaboration with Organization for Security and Co-operation in Europe on transboundary river issues under the Environment and Security Initiative.

The World Bank is finalizing the agreement on the Kura River Delta Rehabilitation Project. The Government of Japan, under its Policy and Human Resource Development Program plans to support institutional strengthening of MENR. Canadian International Development Agency's plans include creating a subregional fund for initiatives under the United Nations Framework Convention on Climate Change. Organization for Security and Co-operation in Europe retains its interest in environmental issues having potential repercussions for peace and security. Among these are transboundary and groundwater monitoring and development of ecotourism.

Recommendations for the Asian Development Bank's Approach and Program

A. Environmental management in Azerbaijan: Asian Development Bank's and Others' Experience

ADB's operations in Azerbaijan are less than 4 years old, a period too short to justify generalizations. The experience of the Flood Mitigation Project is probably sui generis. With this qualification in mind, it exposed the potential conflict between short-term and long-term approaches to flood control, largely coinciding with engineering versus nonengineering responses to dealing with floods. The design largely favors engineering measures, to some displeasure of MENR, which would have preferred more loan funds to be spent on activities addressing the causes of the flood problem (e.g., reforestation).

Few disagree with the need to address the causes, but a reasonable case (supported by worldwide experience in populated mountainous environments) can also be made for a balance of the two, especially where expected benefits of conservation activities are many years away.

The preparation of ADB's Water Supply and Sanitation Project has brought home some of the difficulties inherent in reforming water supply utilities and obstacles standing in the way of more effective demand management. This work has also demonstrated the value of close development partner consultation that makes it possible to send a consistent message to the relevant government counterpart agency.

ADB's experience in other transition economies, let alone that in other developing member countries, is not reviewed here. Suffice it to say that such experience is substantial in both cases. The text gives the example of vehicular emissions, but there are many others (e.g., in salinity control and work related to climate change) that come to mind.

While ADB's experience in Azerbaijan may be limited, that of other development partners is considerable (Appendix 9). The sheer scope and variety of that assistance makes it difficult to generalize. Tentatively, the

areas that deserve particular attention in future assistance include (i) the tendency of most government agencies consistently to underestimate the operation and maintenance cost; (ii) continuing sharp divide throughout the government structure between specialized technical skills and approaches, on the one hand, and broad-based (and cross-sector) management aptitude and approaches, on the other; (iii) lack of confidence and insufficient experience of most government agencies in dealing with nongovernment organizations; (iv) low pay of government staff that demotivates and, in combination with ingrained habits and wrong examples set by parts of the elite, contributes to corrupt practices (most notable in traffic management, urban zoning, and waste disposal); and (v) widely held notions of entitlement to certain types of goods and services (power, water, heating) that come into conflict with the demands of a lasting reform in the corresponding sectors.

B. Asian Development Bank's Environmental Strategy in Azerbaijan

1. Building Blocks

The environmental strategy presented below has four main points of reference. The first is ADB's interim operational strategy for Azerbaijan formulated in 2000 and subsequently updated in the form of country strategy and program updates of 2002. The second is the Government's prioritization culminating in the SPPRED of 2002, the SPESSED of 2003, and SPSEDR 2004–2008. The third is the current (2002) ADB Environmental Policy and its structure of elements and areas of concern. Finally, the country environmental analysis reflects the discussions with government and nongovernment stakeholders conducted during this analysis's preparation.[72]

ADB's interim operational strategy and country strategy and program updates have identified four strategic areas as a guide to ADB's involvement in Azerbaijan (i.e., assistance for IDPs; agriculture and rural development; social infrastructure [primarily water supply, sanitation, and child development]; and roads). In translating this strategic posture into investments, emphasis has been placed on the poverty alleviation context, selectivity, ADB's comparative advantage, and absence of duplication with activities of other development agencies. Four thematic priorities have also

[72] See Appendix 10 for details.

been identified, environmental protection being one of them. While taking these considerations into account, this analysis has attempted to take a fresh look at priorities, in anticipation of the entirely new country strategy and program due to be formulated. Assumed here is the readiness in principle by ADB in 2005 to modify the existing pipeline of lending and nonlending products (2004–2007) that is still based on country strategy and program updates.

2. Selectivity

At the risk of stating the obvious, ADB's environmental strategy should not attempt to address all environmental problems in Azerbaijan, perhaps not even the majority of them. Existence of many problems is not a justification for ADB to diversify its environment-related assistance unduly. Given the initially modest anticipated level of lending to Azerbaijan, too much diversification might dilute the effectiveness of the program as a whole. ADB should understand the complexity but act selectively. Prioritization, usually the most complex aspect of country environmental analysis, is therefore needed. This is developed gradually in the following paragraphs, starting with the role of poverty alleviation in the proposed environmental approach.

Poverty and Environmental Concerns Driving Sector Balance. The relationship between environmental conditions and poverty is a good deal more complex than routine generalizations about the vicious circle into which the two are locked. No details are offered here, but several factors deserve mention in the Azerbaijan context. First, many environmental ills in Azerbaijan, such as mercury contamination, are associated with the past pattern of industrialization, not the scattered use by impoverished masses found in a number of developing countries (e.g., use of mercury by artisanal miners in Brazil and elsewhere). Second, Azerbaijan has maintained a relatively high life expectancy and several other positive health indicators throughout the period of rapid income contraction in the early 1990s (unlike Russia, for instance), posing interesting questions about the nature of the trade-off between income and health outcomes in the Caucasus. Third, the existence of IDPs has introduced an additional dimension to the relationship between environmental status and poverty. IDPs have been the poorest and an unstable segment of the population, once restrictions on the movements of IDPs were removed. This presents policy makers with a difficult choice, both political and economic, of whether to locate income-enhancing and environment-friendly interventions (e.g., slope terracing, tree planting, shelter belt establishment, water conservation, and others) in

temporary settlements or encourage resettlement toward more suitable areas (perhaps urban areas) with related environmental consequences.

Luckily, in Azerbaijan, ADB's prioritization and its environmental dimension are helped by the quality and authority of the SPPRED.[73] The message of SPPRED is clear: First, poverty is not only about income per capita. If it were, assistance should go first and foremost to secondary towns[74] and Baku. Second, once the definition of poverty is enlarged to include access to basic services, the attention to secondary towns and Baku and Sumgayit does not disappear, but a sector focus more clearly emerges, namely water- and health-related infrastructure, which is so crucial to the nonincome dimension of well-being. The relatively small size of ADB's program in Azerbaijan, for the time being, and limits on grant funding then make the water and sanitation sector (including both wastewater and solid waste management) a logical major plank in ADB's involvement in Azerbaijan but also its environmental strategy. The Water Supply and Sanitation Project now under completion by ADB's Social Sectors Division is illustrative of the type of involvement needed more often in future.

The other message of SPPRED is no less important: Poverty is not only about income and income today, but its likely level tomorrow.[75] The poverty picture in Azerbaijan for now may well be dominated by the initial post-Soviet deindustrialization disproportionately affecting urban residents, but the current relative advantage enjoyed by the rural population (having land to turn to for livelihood) is unlikely to last unless the decline in lands' productivity in Azerbaijan is arrested. That decline is obvious to a casual observer as well as statistically documented in the case of irrigated lands (of which more than one third are now without water or are saline). It is being offset somewhat by the positive impact of the land reform (replacing the chaos of the earliest period of Azerbaijan's independence) but not offset fully. These considerations argue in favor of making land degradation (understood to include declines in the productive potential of both arable and nonarable lands) the second plank in ADB's involvement in Azerbaijan and a component of its environmental strategy. The possible modalities of that involvement are discussed later.

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[73] So far, ADB has not followed SPPRED with a separate poverty partnership agreement.

[74] There are 23 secondary towns with populations between 20,000 and 100,000 and another 25 towns with populations between 5,000 and 20,000.

[75] The strategic pillars of SPPRED are (i) enabling environment for income generation; (ii) macroeconomic stability; (iii) access to and quality of education and health; (iv) infrastructure improvement (roads, utilities, and irrigation); (v) reform of social safeguards; and (vi) IDPs.

Partly linked to the second component is poor availability of energy in small towns and rural areas. Besides holding a key to environmental improvements in small towns and rural areas through reduced pressure on forests, energy availability dominates the prospects of idled (or yet to be established) agro-based small and medium-sized enterprises and local employment. Taken together, this provides environment-related ammunition for the third plank of ADB's environmental strategy, namely support for improved energy provision for secondary towns and rural areas, understood to include improved power or gas distribution and new sources of renewable energy for decentralized provision.

The sector preference for (i) water and sanitation, (ii) activities to counter land degradation, and (iii) energy provision for secondary towns and villages are therefore recommended on environmental grounds. Here, the compelling environmental reasons join the equally compelling livelihood reasons. There may well be a separate justification for inclusion of other sectors (e.g., roads and education) in the new country strategy and program, but this will be driven mainly by nonenvironmental considerations.[76] An additional area, whose seriousness is not in doubt but whose appropriate sector labeling is, would be (iv) air pollution and traffic congestion in Baku. For simplicity, we shall deal with this under the transport sector.

As for IDPs featuring importantly in ADB's interim strategy, alongside the emphasis on three sectors (agriculture and rural development, roads, and social infrastructure) this analysis does not single out IDPs as a distinct problem. By now, IDPs are increasingly resettled in Azerbaijan. Targeting IDPs (or even more, IDP locations) as a separate priority makes less sense now than targeting environmental concerns that affect IDPs and non-IDPs alike (among which pasture degradation and sanitation come immediately to mind).

Urban-Rural Balance. The four sector priorities favored here on environmental grounds imply a significant measure of deconcentration of assistance away from the Baku-Sumgayit area. This is clearly the case in terms of land degradation and energy but much less so in water and sanitation.[77] There are good reasons, related mainly to waste management but also to transport management, for ADB not to abandon Absheron and

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[76] The support given by the SPPRED to pro-poor capital projects (such as roads) or ADB's comparative advantage in implementing certain kinds of projects (roads, education, and health infrastructure, and others) may well be among them.

[77] Important to bear in mind is that in the Azeri context, many small towns have rural features and exhibit the sort of underdevelopment characteristic of the countryside, with inadequate water supply and sanitation high on the list. Should the country strategy and program take a rural slant, it should still be possible to make water, wastewater, and solid waste management in small and secondary towns a component of such a strategy.

Baku. Such an approach is also in line with the SPPRED, which envisages priority in social infrastructure (especially waste management) to be shared between Baku-Sumgayit and selected second-tier towns.

The recommended sector mix does stretch ADB's staff resources by combining urban concerns (water and sanitation and energy) with rural concerns and, within the former, proposing to direct resources also to secondary cities, normally exacting a higher administrative cost than projects implemented or largely run from the country's capital. However, this drawback may be compensated for by the scope for ordinary capital resources lending for energy-related and water supply and sanitation projects, which is significantly greater in Azerbaijan than in a number of other developing member countries.

Thematic Approach. In addition to sector priorities, ADB's interim strategy for Azerbaijan identifies four thematic priorities (environmental protection, private sector, good governance, and gender). This analysis is strongly in favor of retaining the first two, each for different reasons. The support for the first is separate from the sector basis of the environmental strategy championed here (that amounts to recommending ADB assistance to the water and sanitation, land degradation, decentralized energy, and transport sectors as an efficient way of delivering environmental [understood to include also health-related] benefits). By contrast, the thematic preference means that environmental protection is to be given prominence in whatever sector mix may end up being chosen in the new country strategy and program. This preference will typically be translated into an environmentally proactive design of projects and programs. It may result in, for example, transport improvement projects linked to activities addressing mobile source pollution and road safety, solid waste management projects accompanied by steps to deal with contaminated soils, or land rehabilitation activities accompanied by support for environmental education or others.

Besides having its own rationale not discussed here, the priority given to private sector development complements that given to environmental protection in one important and until now insufficiently explored way. Driven by own interest and strict regulatory demands at home, the private sector, especially the modern international oil and gas industry, has become an important source of environmental know-how and funding in Azerbaijan and regionally.[78] Other potential private investors could play a role. This

[78] The Baku-Tbilisi-Ceyhan consortium alone is providing grants worth approximately $10 million for environmental protection and community development programs, the latter more advanced conceptually and as thorough as most similar programs implemented by bilateral development partners. Companies such as British Petroleum, Exxon Mobil, and Statoil have been funding a variety of environmental projects over roughly the last 7 years.

opens the way for various forms of collaboration that could combine the industry's technological prowess (e.g., in the decontamination of old oil-polluted soils) with own and other parties' financial resources. The project proposal for rehabilitation of contaminated sites in Greater Baku is an illustration of the type of collaborative projects in which ADB could play a catalytic role.

3. Programming Recommendations

In translating the broad sector and thematic prioritization into specific programming recommendations, we proceed in two steps. First, we describe the essentials of the needed approach under each of the four sector priorities recommended (and further subdivided, in some cases). Second, we list specific ideas for loan and technical assistance consistent with each approach.

a. Sector Priority 1 (Water and Sanitation)

Water and Wastewater The large unfinished institutional reform agenda must remain at the forefront of ADB's involvement in the sector. Some progress in water metering in Baku under the World Bank-financed Water Supply Project should not be taken as lessening the need substantially to improve the efficiency in water use in all of Azerbaijan's towns (including Baku) and put it ahead of simple expansion of capacity. If anything, however, the challenge in Azerbaijan (and most other FSU countries) is not to expand capacity but to modernize crumbling overcapacity. Cost recovery in these conditions may have to be approached differently than in standard textbooks. ADB needs to digest the nondogmatic approach to the problem championed by the likes of the Organisation for Economic Co-operation and Development's Task Force for the Implementation of the Environmental Action Program for Eastern Europe, Caucasus and Central Asia[79] rather than rely on prescriptions that better fit situations typical of traditional developing member countries, where no previous capacity exists. Nevertheless, many other concerns will remain unchanged, increased transparency in the collection and use of water tariffs typical of these. The proposal for testing low-cost approaches to improving access to water in Azerbaijan's cities illustrates the type of activity that responds to existing concerns, even if it requires sensitivity to the overcapacity dilemma. With

[79] Typified by Organisation for Economic Co-operation and Development. 2003. *Financing Strategies for Water and Environmental Infrastructure*. Paris.

the caveats mentioned above, ADB's Urban Environmental Profile's call for ADB to assume a leading role in policy coordination (intradevelopment partner as well development partner-government) is well taken. The preparation of the Water Supply and Sanitation Loan has generated ample information for ADB and the Government to decide the location of future water supply and sanitation activities.

Solid and Hazardous Waste Management. ADB should have few doubts that the Absheron Peninsula is where the country's industrial and urban environmental problems are concentrated and where action is required. It is equally important for ADB to realistically judge the scale of the remedial task. A significant and lasting improvement of environmental conditions in this area requires not only synchronized activities of many development partners (that will inevitably squeeze resources available for other parts of the country) but also a significant inflow of private foreign capital and probably also a special status given to the Absheron Peninsula or its well-chosen part(s). If ADB is to become involved, it should be mainly to help bring about such coordinated response. Without these, ADB's program is far too small to make a dent in the problem.

For many years the debate has been conducted largely in terms of technical approaches to dealing with contaminants (oil-contaminated soils and toxic contaminants, such as mercury). The several initiatives undertaken in this domain were mentioned earlier. Absent are two key elements: (i) a vision for the Absheron Peninsula and zoning of economic and other activities that would reflect the Absheron Peninsula's unique problems and unique opportunities and (ii) policy and institutional integration that is required to deal with the issue systematically and efficiently. This might require a single body, elevated to a position of prominence, capable of uniting several ongoing or planned initiatives (e.g., World Bank-supported hazardous waste management strategy, the waste management priorities of the SPPRED, the program of municipal waste management outlined only in the SPESSED, Sumgayit City Environmental Rehabilitation Plan, and others), and driving consensus-building involving Baku City Municipality, MENR, Ministry of Finance, State Oil Corporation, and others. Needed also is fresh thinking about the merits of (i) targeting the worst among polluted parts of the Absheron Peninsula as sites of future landfills, (ii) reclaiming contaminated sites with high potential amenity value into green or commercial spaces, and (iii) making parts of the cleanup self-financing through the involvement of the private sector under an appropriate fiscal regime for contaminated or compensation areas. Apart from dealing with contamination, such activities could revitalize areas adjacent to the targeted sites, now disproportionately occupied by the relatively worse off among

the urban population. An approach to rehabilitation of selected contaminated sites in Greater Baku can be developed by ADB, acting in coordination with its partners in the Cities' Alliance Program.[80]

The case for ADB's support of solid waste management in secondary towns (i.e., those outside the Absheron Peninsula and the cities of Baku and Sumgayit) is stronger in the largest of these towns (especially Ali-Bayramli and Ganja, prioritized also in the SPPRED) than in the smallest of these. Regardless of size, however, that support, if it is to take place, should be conditional on a further shift of policy and practice toward sustainability. Unlike water supply and (to a much smaller extent) wastewater treatment, solid and hazardous waste disposal is not affected by the old-capacity problem (few if any appropriate landfills and disposal facilities exist).

b. Sector Priority 2 (Land Degradation)

Irrigation, Drainage, and Land Reclamation. Given the transboundary origin of Azerbaijan's principal rivers (Aras, Kura, and Samur), the support by the development partner community (e.g., European Union, Organization for Security and Co-operation in Europe, and United States Agency for International Development) for improving cross-border collaborative approaches to these rivers' management has a sound basis, although its effectiveness may have temporarily stopped increasing. At the same time, there are a large number of internal smaller rivers vital for the life of local communities, the management of which has been neglected or featured only in relation to flood threats or hydropower potential (e.g., some of the rivers in the Sheki-Zaqatala region). Local populations have played little role in decisions regarding these rivers' management, and in many cases these rivers are no more than convenient sewers. The institutional basis for and experience with integrated river basin management are weak. ADB can help fill some of this void through technical assistance or small Poverty and Environment Program-type projects intended, in the first instance, to take stock of the water resource potential of these rivers and help reorient the approach to their management toward a basinwide and community-influenced one.

The scale of the irrigation and drainage rehabilitation task in Azerbaijan is very large. The technical requirements of rehabilitation are well known, but the challenge of creating arrangements for sustained maintenance by

[80] It is important to be aware, at the same time, of the differences between cities of transition economies and those of more typical developing countries. The former have poverty (and many other problems) but not slums as conventionally understood. The Cities' Alliance Program is slum-driven. This dictates differences in approach.

those served by the infrastructure has not been fully met yet in Azerbaijan. As is so often the case around the world, easy engineering needs to be combined with difficult local organization of water users and tough political decisions on water tariffs. Not unlike in urban water supply, cost recovery in Azerbaijan's irrigation is handicapped by the crumbling overcapacity phenomenon. The loss of some of the country's most productive arable land and ADB's vast experience in irrigation and drainage argue strongly for ADB's involvement, but an assessment of the experience of the World Bank- and Islamic Development Bank-funded rehabilitation schemes should precede any such decision.

Some irrigation and drainage projects are much more than that. This is most notably the case of the Absheron-Samur Canal Rehabilitation, one of the objectives of which is to supply of good-quality water to the Absheron Peninsula. The project relies significantly on harvesting the runoff of smaller rivers of the Greater Caucasus–and in this sense it complements the recommended attention to smaller rivers–and on maintaining the water quality throughout the canal length. It is rich in environmental repercussions and offers some scope for escaping the criticism of having too much engineering and too little environmental foresight. It also suggests a possible balance of support in ADB's portfolio: water supply and sanitation projects targeting secondary towns and the Samur-Absheron project targeting Baku and Sumgayit. That a costly provision of additional water to Baku and Sumgayit would have to be preceded by hard questions about the existing efficiency of water use in the Absheron agglomeration goes almost without saying by now.

The traditional focus on irrigation and drainage in Azerbaijan should not obscure other cost-effective possibilities of reclaiming productive land, for instance the thousands of hectares of potentially fertile stone-littered alluvium in the foothills of the Greater Caucasus, created by flooding.

Reforestation and Pastureland Management. The dismantling of collective and state farms has had a number of positive and negative impacts. The precipitous deterioration of irrigation and drainage infrastructure in the traditionally irrigated areas, mentioned earlier, leads the negative list. That list contains other items, increased pressure on pasture- and forestland resources close to the top. Rightly preoccupied with privatization of arable lands until now, the Government is finally turning attention to the deterioration of pasturelands (that remain in state hands). A multiagency review of pastureland management led by MENR is now underway and steps are to be implemented to control stocking density. A national action plan to combat desertification is being drafted, in which the conditions of pastureland promise to occupy a prominent place.

In terms of landscape protection and the fight against soil erosion, the gradual revival of fruit-tree planting, after years of destruction of former kolkhoz plantations and their conversion to annual cropping is encouraging. Steady advance of the land reform and well-targeted assistance by specialized development partners (International Fund for Agricultural Development, United States Agency for International Development, and others) are probably the best form of support, and ADB can only applaud it. However, planting fast-growing fuelwood on private land, so common in many parts of the world, has yet to take off in Azerbaijan, where the expectation lingers that the Government, and only the Government, will ultimately fix the energy problem.

As to forestland, no less vital in Azerbaijan than in most other countries, these have received insufficient attention in recent years, and the typical annual budget of any of 28 forest development and rehabilitation enterprises, MENR's arms of forestland management, is smaller than the cost of a luxury car, of which hundreds ply the streets of Baku. The problem may well be one of priority assigned to forest rehabilitation, but there are other factors to consider. Forest administration has undergone several reorganizations in recent years, and its new mandate within MENR remains unclear. Second, from the Soviet days, management of the forest has remained a semi military activity, excluding the local population. Paradoxically, this creates an opportunity to reform the approach to forest rehabilitation in the direction of greater involvement of the local population, accompanied by a measure of respect foresters still command. There are attractive opportunities for ADB in this area, combined with strong global benefits of forest rehabilitation in Azerbaijan.

c. Sector Priority 3 (Decentralized Energy)

Increased pressure on forest resources in the postindependence period in Azerbaijan is closely related to the deterioration, outright disruption, or nonexistence of the supply of electricity and coal or gas to smaller communities (in turn a complex outcome of the weakening of state utilities in the aftermath of independence, and in some cases, dismantling of kolkhozes). In the absence of alternative energy sources, forests have acted as a last resort with serious environmental consequences. The prospects of restoring forest cover and reducing the need for expensive flood control projects of the kind ADB is about to finance in Azerbaijan are clearly affected by the advances made in restoring and further improving energy alternatives to wood or by making sustainable fuelwood production a deliberate priority. Rehabilitation of power distribution infrastructure, extension of gas supply

networks, and creation of new energy sources (especially of the renewable kind) are all activities offering not only major livelihood benefits but also major environmental gains. As in the case of water, however, a substantial unfinished policy agenda centered on cost recovery needs to be part of any possible ADB future involvement. On the technical assistance side, interesting opportunities exist to (i) transfer to Azerbaijan ADB's Asian experience with bio-gas and (ii) support efforts to tap the considerable minihydro potential.

d. Sector Priority 4 (Transport)

Mobile Source Pollution, Congestion, and Safety. The pattern of air pollution in Absheron Peninsula and Baku has been changing. Many original stationary sources are no longer active and, instead, mobile sources are fast becoming the principal air quality concern. No less serious is another dimension of transport management, i.e. driver and public safety. Baku is plagued by a growing number of new and undisciplined drivers; a disregard for pedestrians; a police force that, for the most part, does not know traffic rules and is accustomed to being bribed; and the new elites that have so far set the wrong example. Also, based on current trends and without reform, congestion will soon become a major source of economic and social cost.

There is a great deal that ADB can bring to this area of concern, based on its numerous recent activities in Asia. The Reducing Vehicle Emissions Project and the extensive analytical and practical material that project spawned have a high degree of applicability in Azerbaijan (except perhaps for experience relating to two-wheelers that are of marginal importance) and would deserve to be imported as soon as possible. Similarly, the Clean Air Initiative for Asian Cities (Regional Technical Assistance 6016) and the associated Public Health and Air Pollution in Asia have immediate relevance to Baku. In Azerbaijan, the public awareness element would merit particular attention. A phased program of eliminating personal vehicles without catalytic converters should be put in place as soon as possible to facilitate the leaded gasoline phaseout, building on the important UNECE- and World Bank-led work in 1998–2000. Azerbaijan could also draw on the experience of several air-quality improvement programs implemented in Asia with ADB or World Bank assistance (e.g., Bangkok, Manila, New Delhi, and others) and study the recent experience of its neighbor, Georgia, in reforming the traffic police. A sector program as comprehensive as those in the cities mentioned may soon become indispensable in Baku. ADB should stand ready to extend an ordinary capital resources loan, possibly substituting it for conventional road rehabilitation projects.

If roads are to remain among ADB's priorities in Azerbaijan in the new country strategy and program (not least because of ADB's solid implementation record in this domain elsewhere in Asia), the design of assistance for road rehabilitation and other transport infrastructure should consider a more proactive search for environmental benefits. Some of this could well take the form of linked advisory technical assistance transferring to Azerbaijan the valuable Asian experience described. There are other possibilities, too, focusing on project design. Developing road rehabilitation contracts inclusive of road tree planting and subsequent maintenance; linking road building with road safety campaigns;[81] and linking road building with urban environmental civil works (e.g., landfill establishment, removal of contaminated soils, and others) to maximize the use of heavy equipment are among the possibilities.

ADB's approach to controlling air pollution by nonmobile sources in Azerbaijan should be to (i) consider it a second-order priority in the short term (1–3 years) and (ii) structure subsequent support around the monitoring of plant-level emissions, enforcement of emissions standards, and possible reform of the emissions charge system.

C. Regional Considerations

Through the link between wastewater management and the ultimate river or direct discharges into the Caspian Sea, at least one (Water Supply and Sanitation) and possibly two (Rehabilitation of Contaminated Sites in Baku) projects acquire a subregional dimension.

Under existing ADB policies, the scope for more deliberately formulating regional environmental initiatives involving Azerbaijan depends more heavily on the regional pattern of ADB membership than in other types of regional initiatives (e.g., finance, transport planning, management of oil revenue, and others). As long as Iran and Russia remain nonmembers, any regional initiatives involving all Caspian coastal countries (such as the Caspian Environmental Program), for instance, are infeasible. Similarly, the absence of Georgia from the ranks of ADB's member countries precludes any support for Caucasus wide regional initiatives.[82] That does not mean

[81] Existing regulations in the transport sector call for some of these activities in any case.

[82] The dispute with Armenia over the Nagorno-Karabakh area further complicates Caucasus wide collaboration. Interestingly, Armenia and Azerbaijan do collaborate in some regional environmental organizations or programs, such as the Regional Environmental Center for the Caucasus or the World Wildlife Fund Caucasus program.

that no subregional efforts would be possible.[83] First, the modus operandi of the Caspian Environmental Program allows subregional cooperation to be targeted at a subset of the Caspian Environmental Program member countries. Second, Azerbaijan might be associated with several planned subregional technical assistance undertakings involving FSU countries, especially those where technical challenges are shared. For example, Azerbaijan might benefit from the evolving experience of the Central Asia Initiative on Land Management in activities targeting land degradation.

Nevertheless, based on ADB's own mixed experience with regional activities in Central Asia, it is proposed that other than encouraging an observer status for Azerbaijan in ADB-sponsored regional for a, such as of the Central Asia Initiative on Land Management, no subregional environmental activities involving Azerbaijan should be considered for the time being, unless some of Azerbaijan's immediate neighbors (most notably Georgia, Iran, and Russia) become ADB members. ADB's short- to medium-term environmental strategy in Azerbaijan should therefore be essentially country-based with a readiness, however, to respond to regional opportunities, if the pattern of ADB membership changes.

D. Conclusions and Recommendations

The labels FSU countries and transition economies are not empty. The imprint of the Soviet era, with the economic pluses and minuses, combined in complex ways to place special demands on policy responses. Among the special factors accentuated by the disintegration of the Soviet Union is the large stock of nonperforming or obsolescent capital goods, a skills base poorly adapted to new circumstances, and no (suitable) institutional memory on which to fall back.

These and other features affect also environmental management. The wrong size and structure of many urban environmental assets, the absence of suitable arrangements for managing the irrigation and drainage control infrastructure, and a legacy of old contamination outstripping the resources of the remaining industry are just some of the structural factors confronting a reformer.

Azerbaijan's position as one of Asia's hydrocarbon tigers should not invite the expectations of a rapid solution to decades-old (and some new)

[83] Important to bear in mind throughout is that there are a number of subregional environmental projects that are funded by sources that are not bound by ADB procurement rules. Some (e.g., efforts to improve the management of the transboundary Kura River) show considerable promise.

environmental problems. At the same time, the resurgence of the oil industry and rising oil revenues do create opportunities. Money helps, and Azerbaijan is probably better placed than several other FSU countries to create the institutional preconditions needed for tackling environmental problems as well as providing counterpart financing to loans.

The Government and ADB share a vision of economic and social progress in which incomes alone do not tell the whole story, and existence of basic social infrastructure is its essential dimension. There are numerous ways in which ADB can support this vision, in particular in water supply and sanitation improvement, and the upper limit to such assistance is posed by (i) country-risk considerations and (ii) complexity of policies needed to overhaul sectors affected by overcapacity and recent neglect.

ADB should seize available opportunities to structure its assistance to deliver environmental benefits as a byproduct of income-enhancing activities. The scope for such activities in Azerbaijan is not insignificant, and rehabilitation of degraded arable lands or islands of urban oil contamination are two obvious examples.

Within an approach that places emphasis on the complementary nature of income growth and environmental outcomes, as well as attention to social infrastructure and quality of life, other good opportunities for assistance with far-reaching positive environmental repercussions can be found in decentralized energy provision and air quality management in Baku. There is scope for novel approaches to forest rehabilitation and for rethinking the institutional approach to the management of small (nontransboundary) rivers. Environmental awareness and education need a major boost everywhere. By making environmental protection a thematic priority, ADB assistance can also use project and program design to enhance the environmental content of activities (e.g., road building) normally thought to be beyond reform.

The sector and programming elements of the recommended environmental strategy were summarized. Table 5 adds several other considerations (including institutional ones), forcing them into the format of ADB's 2002 *Environmental Policy*.

Table 5: Environmental Strategy for Azerbaijan: A Few Reminders

Asian Development Bank Environmental Policy Elements and Areas of Concern to be Given Prominence	Justification of the Selection and Emphasis	Recommended Approach to Implementation
ELEMENT 1 Environment Interventions for Poverty Reduction	Both the Asian Development Bank (ADB)'s mandate and the Government's State Program on Poverty Reduction and Economic Development demand it, though indirectly. Assistance will be based on a broad interpretation of environmental intervention and a definition of poverty that includes its nonincome dimension.	- Give preference to interventions that deliver environmental benefits as a byproduct of pro-poor productivity enhancement (e.g., rehabilitation of degraded arable lands through irrigation and drainage projects). - Insist that poverty is more than low incomes with resulting emphasis on social infrastructure (e.g., water supply and sanitation projects in secondary cities). - Search for environmental activities with demonstrable impacts on livelihoods (e.g.,rehabilitation of forests with local communities' participation) - Acknowledge the spatial distribution of poverty now and its likely change over time in proposed activities (e.g., pay sufficient attention to secondary towns, at least initially)
Area 1 Protection, Conservation and Sustainable Use of Natural Resources	Alarming decline in the conditions of several key renewable resources (arable land, water, and pastureland), and recognition of its seriousness by the Government. Good match with ADB experience.	- In land rehabilitation projects, ensure that attention to sustainability occupies a prominent place. - Make efficiency in the use of potable and irrigation water a key to conservation and give it a prominent place in project design. - Suitably locate (e.g., in buffer zones) own interventions to reinforce pure conservation efforts financed by others.

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Table 5: Environmental Strategy for Azerbaijan: A Few Reminders
(continued)

Asian Development Bank Environmental Policy Elements and Areas of Concern to be Given Prominence	Justification of the Selection and Emphasis	Recommended Approach to Implementation
Area 2 Environment Quality Improvement	Azerbaijan confronts a huge legacy of past industrial pollution and contamination (mainly but not only oil-related), an aspect of urban poverty. Many of Azerbaijan's rivers are seriously polluted, fundamentally affecting the quality of life. Only part of the problem is transboundary in origin.	- Recognize the enormity of the decontamination and rehabilitation task in the Baku-Sumgayit area. Help bring about a coordinated response. Pilot the use of economic incentives for private sector participation in urban land decontamination and rehabilitation. Link such activities to a program of landfill creation. Tap nongovernment organizations for suitable rehabilitation activities (e.g., urban greening). - Support water supply and sanitation projects. - Consider solid waste disposal an aspect of water pollution control. - Support a basin wide approach to river management. - Give sufficient importance to the role of small rivers for livelihood and health and help bring about basin wide approach to river management. - Consider a program loan to deal with mobile source pollution in Baku.
	Mobile source pollution, congestion, and traffic accidents are becoming a serious issue in Baku. Nondrivers and urban poor are also affected.	- Consider advisory technical assistance, linked to possible future road projects, transferring to Azerbaijan the Asian experience in vehicular pollution and congestion control. - Make traffic management an important aspect of these activities.

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Table 5: Environmental Strategy for Azerbaijan: A Few Reminders
(continued)

Asian Development Bank Environmental Policy Elements and Areas of Concern to be Given Prominence	Justification of the Selection and Emphasis	Recommended Approach to Implementation
		- Strive for the right balance of interventions in which prevention (e.g., forest conservation or erosion control) is at least as important as engineering mitigation measures. - Support United Nations Development Programme's efforts to make disaster preparedness a civilian endeavor integrated into the fabric of economic decision making.
Area 3 Reducing Vulnerability to Natural Hazards and Preventing Disasters	Flash floods are a long-standing problem in the Greater Caucasus. Food insecurity continues to be a problem, especially among internally displaced persons.	- Promote diversification of rural incomes and better land use as mechanisms of vulnerability reduction.
ELEMENT 2 Mainstreaming Environmental Considerations in Economic Growth		
Area 1 Policy Integration	The process of integrating environmental concerns into policy is far from finished.	- Lead the policy and institutional integration in areas vital to ADB's country strategy and program and environmental strategy, such as water supply and sanitation.

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Table 5: Environmental Strategy for Azerbaijan: A Few Reminders
(continued)

Asian Development Bank Environmental Policy Elements and Areas of Concern to be Given Prominence	Justification of the Selection and Emphasis	Recommended Approach to Implementation
		- Keep abreast of the Government's progress in developing integrated response in areas vital to environmental management, such as pastureland management or land rehabilitation.
Area 2 Integrated Economic and Environment Development Planning	Approach to environmental problems tends to be excessively top-down and agency-based, rather than problem solving-based.	- Support an approach to improved decentralized energy provision in tandem with efforts to reduce local deforestation. - Participate in, or spearhead, efforts to overcome lack of policy integration in dealing with complex problems, such as rehabilitation of oil-contaminated areas or basin wide river management.
Area 3 Strengthening Regulatory Systems and Environmental Governance	Effectiveness of environmental regulation in Azerbaijan suffers from overlaps of institutional mandates, funding constraints at the local level, and ingrained traditions of nepotism and taking bribes.	- Support greater role for local communities in influencing environmental policy and investments. - Drive greater institutional collaboration involving the Ministry of Agriculture (State Committee for Land Improvement and Irrigation), Ministry of Environment and Natural Resources, and State Committee for Construction and Architecture through example (in preparing water supply and sanitation, flood protection, or irrigation and drainage loans).

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Table 5: Environmental Strategy for Azerbaijan: A Few Reminders
(continued)

Asian Development Bank Environmental Policy Elements and Areas of Concern to be Given Prominence	Justification of the Selection and Emphasis	Recommended Approach to Implementation
		- Consider extending advisory assistance for developing an institutional structure suited to basin wide management of internal rivers in Azerbaijan. - Pay closer attention to financing of environment-related activities at the local level and review the arguments for increased local budget allocations. - In dialogue with the Government, make maximum room for local nongovernment organizations to contribute to environmental debate and implement suitable components of assistance.
Area 4 Market-Based Instruments and Other Instruments	Pricing of water and urban environmental services and pattern of taxation continue to exercise powerful impact on environmental outcomes. Some interestingly novel applications seem possible.	- Continue to set an example in fighting nepotism in areas such as procurement and consultant use. Help translate *bribe* into Azeri. - Continue to demand up-to-date information on the degree of cost recovery in essential urban services. - In own lending, introduce mixed policy tools and approaches to encourage efficiency in water use (e.g., water metering combined with audits of households in collective dwellings) - Encourage greater use of fiscal instruments in support of environmental quality (e.g., tax incentives to encourage reclamation of old contaminated areas, changes in the pattern of excises to reduce air pollution and congestion)

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Table 5: Environmental Strategy for Azerbaijan: A Few Reminders
(continued)

Asian Development Bank Environmental Policy Elements and Areas of Concern to be Given Prominence	Justification of the Selection and Emphasis	Recommended Approach to Implementation
Area 5 Promoting Education and Public Awareness	A striking weakness, especially outside Baku, and a threat to sustainability of projects otherwise suitable for inclusion into a country strategy and program.	- Explore the potential for the use of transferable development rights to deal with decontamination and rehabilitation of oil-contaminated sections of central Baku, possibly as a component of related advisory assistance. - Make public awareness a component of lending or technical assistance for activities such as improved water supply, waste management, reforestation, or surface water pollution. - Consider sponsoring television environmental campaigns, possibly using some of ADB's public environmental awareness material (including suitable material from other countries).
ELEMENT 3 Maintaining Global and Regional Life Support Systems		
Area 1 Responding to Multilateral Environmental Agreements	Continued support is needed to bridge the gap between the obligations assumed by GOM and the capacity to meet these.	- Give adequate attention to the completion of those among conventions-related obligations that most closely relate to the proposed ADB environmental strategy (e.g., drafting of the National Action Plan to Combat Desertification, and preparation of national communications under the United Nations Framework Convention on Climate Change).

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Table 5: Environmental Strategy for Azerbaijan: A Few Reminders
(continued)

Asian Development Bank Environmental Policy Elements and Areas of Concern to be Given Prominence	Justification of the Selection and Emphasis	Recommended Approach to Implementation
		- Reflect the analysis and recommendations of this process and documentation in the sector and thematic balance of the country strategy and program and country assistance plan. - Begin to develop actively a possible portfolio of projects for Global Environmental Fund cofinancing, drawing on recent Global Environmental Fund-financed activities in the country.
Area 2 Supporting Regional and Subregional Cooperation on Environment	Pattern of ADB membership (absence of all of Azerbaijan's neighbors) limits the scope for subregional cooperation in environmental matters. It is important, nevertheless, to anticipate changes in that pattern and start preparing for action.	- Be ready to consider turning to the Caspian Environmental Program for possible regional environmental assistance involving only ADB Caspian developing member countries (i.e., Azerbaijan, Kazakhstan, and Turkmenistan). - Learn from the experience of European Union Technical Assistance to Commonwealth of Independent States, Organization for Security and Co-operation in Europe, United Nations Economic Commission for Europe, United States Agency for International Development and others in supporting regional environmental cooperation in Southern Caucasus. - Consider the possibility of including Azerbaijan into the scope of Central Asia Initiative on Land Management, initially in an observer capacity. - Pay sufficient attention to the activities of United Nations

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Table 5: Environmental Strategy for Azerbaijan: A Few Reminders
(continued)

Asian Development Bank Environmental Policy Elements and Areas of Concern to be Given Prominence	Justification of the Selection and Emphasis	Recommended Approach to Implementation
		Economic Commission for Europe and Organisation for Economic Co-operation and Development in transferring to Azerbaijan the best of the industrialized world's environmental practices.
ELEMENT 4 Building Partnerships		- Continue developing closer partnership with Global Environmental Fund for possible future cofinanced activities in Azerbaijan under the Global Environmental Fund's Operational Program 12 and Operational Program 15. - Begin to think about future possibilities related to some or all of Azerbaijan's neighbors joining ADB (e.g., transboundary water management, phasing out leaded gasoline and others). - Learn more about the environmental activities of the private sector in Azerbaijan, especially the oil industry. More actively explore the potential for cofinancing certain technical assistance activities with the private sector
ELEMENT 5 Integrating Environmental Considerations into ADB Operations		
Area 1 Country Environmental Analysis	Country environmental analysis now a mandatory element of country	- Regardless of its final form, consider the country environmental analysis an invitation to keep exploring the

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Table 5: Environmental Strategy for Azerbaijan: A Few Reminders
(continued)

Asian Development Bank Environmental Policy Elements and Areas of Concern to be Given Prominence	Justification of the Selection and Emphasis	Recommended Approach to Implementation
	strategy and program formulation. Emphasis is on making it a living document, lending itself to updating and serving as a background to continuous dialogue between ADB, the Government, and civil society.	issues presented and demand updates and revisions. - Country environmental analysis should not be the sole analytical effort in environment. More specific analyses may be needed in Azerbaijan from time to time to support certain lending activities (e.g., urban development).
Area 2		
Public Consultation and Information Disclosure	Insufficient attention was given to these issues during the initial period of ADB's operations in the country.	- Encourage ADB's resident mission to familiarize itself with ADB's environmental agenda, policies, practices (environmental impact assessment), and project opportunities (Poverty and Environment Program, Japan Fund for Poverty Reduction, and others). - Produce a folder summarizing (in English and Azeri) information relevant to ADB's environment-related activities in Azerbaijan and regionally and procedures for involving nongovernment organizations in ADB activities (to be given to interested nongovernment organizations). - Press for better development partner coordination and less duplication in broad environment-related assessments. More readily accept the best of other agencies' work and establish internal procedures to encourage this style of work. - Ensure timely availability of the country environmental analysis on ADB's website and in Baku.

Appendixes

Appendix 1: National Environmental Action Plan Priority Environmental Actions

Appendix 2: Strategic Government Environmental Priorities after 2000

Appendix 3: Selected Country Environmental Indicators

Appendix 4: Selected Environmental Statistics of Azerbaijan

Appendix 5: Principal Environmental Laws of Azerbaijan

Appendix 6: Nature Reserves and Conservation Areas of Azerbaijan

Appendix 7: Azerbaijan's Participation in International Environmental Agreements

Appendix 8: Asian Development Bank Assistance for Environment mental Management in Azerbaijan (2001–2004)

Appendix 9: Development Partner Assistance to Environmental Management in Azerbaijan

Appendix 10: Country Environmental Analysis Consultation Process

Appendix 1

National Environmental Action Plan Priority Environmental Actions[1]

Category	Objective	Actions	Responsible Authority	Degree of Priority	Cost Estimate (1997 $ Million)
I. Population from Industrial Production, Energy Production, Transport, and Other Sources					
Industry	Eliminate mercury emissions into the environment.	Terminate the production of chlorine and sodium hydroxide using the mercury process.	Executive authorities of the Agency of Missing Safety, Chlor-Alkali Plant, and Sumgait City;	2	
	Decrease mercury concentrations in the environment and reduce threats to human health.	Clean and safely dispose of mercury residuals.	cabinet of ministers; Ministry of Health; municipal authorities of Absheron and Khyzyn *rayons* (administrative districts) and Sumgayit City; and State Committee for the Environment (SCE).	1	4.00
	Clean oil-contaminated lands.	Establish a pilot program to clean critical oil spills in 2,000 hectares of the Absheron Peninsula.	State Oil Company of Azerbaijan Republic, municipal authorities in affected areas,	1	5.00

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[1] Reproduced from the National Environmental Action Plan (1997) and www.eco.aznet.org

National Environmental Action Plan Priority Environmental Actions[1]
(continued)

Category	Objective	Actions	Responsible Authority	Degree of Priority	Cost Estimate (1997 $ Million)
			State Committee on Land and Research Institute on Soil.		
	Reduce the risks of oil contamination from refinery wastes.	Reclaim residual products form refinery wastes.	AZERNEFTIAGIA (industrial association).	2	0.40
Energy	Reduce natural gas discharges into the air.	Build a compressor station to collect low pressure gas.	AZERIGAS, AZERENERGY, and Agency on Mining Safety.	1	5.00
	Reduce ambient concentrations of air pollutants associated with Ali-Bairamly power station.	Increase the length of the power station chimney.	AZERENERGY IA.	2	1.00
	Decrease air pollution emissions from the Baku TEC-1 power stations (nitrogen oxide by 40–50% and benzopirene by 50–70%) and increase power output. Encourage the switch to environmentally cleaner sources of energy:	Introduce the system of burning a water and fuel oil emulsion at stations.	AZERNEFTIAG IA.	2	1.00

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[1] Reproduced from the National Environmental Action Plan (1997) and www.eco.aznet.org

National Environmental Action Plan Priority Environmental Actions[1]
(continued)

Category	Objective	Actions	Responsible Authority	Degree of Priority	Cost Estimate (1997 $ Million)
	(i) Develop geothermal energy sources.	Identify cost-effective sources of geothermal energy.	AZERENERGY, SCE, and Utility Committee.	1	0.05
	(ii) Develop hydroelectric power sources.	(1) Rehabilitate a small hydroelectric source in Shekhi.	AZERENERGY, Hydromet, and SCE.	1	3.00
Transport	Reduce ambient lead levels in the environment.	Develop a strategy to phase out the production of leaded gasoline.	AZERNEFTIAG IA and SCE.	2	
	Reduce vehicular emissions.	Require catalytic converters in all new imported cars (0–6 years old), and increase registration fees for diesel or older (8–10 years old) passenger cars.	Cabinet of ministers.		
Other categories	Decrease public exposure to radioactive wastes.	Expand and reconstruct sites and methodologies for safe disposal and cleaning of radioactive waste.	Agency on Mining Safety, IZOTOP, and Ministry of Health.	1	4.00
	Reduce the dangers to public health from exposure to radon.	Assess public exposure to radon and develop appropriate protective protocols.	IZOTOP, SCE, and Ministry of Health.	2	0.20

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[1] Reproduced from the National Environmental Action Plan (1997) and www.eco.aznet.org

National Environmental Action Plan Priority Environmental Actions[1]
(continued)

Category	Objective	Actions	Responsible Authority	Degree of Priority	Cost Estimate (1997 $ Million)
	Protect water supplies from municipal waste water effluents.	Build a water treatment plant and sewage system in Sumgayit	Sumgayit municipal authorities.	1	
		Expand water treatment capacity in Baku.	Baku municipal authorities.	2	
		Complete construction of the sewage system and treatment plant in Ganja.	Ganja municipal authorities.	1	
II. The Caspian Sea					
Fisheries	Increase Caspian sturgeon stocks.	Rehabilitate fish hatcheries to increase output capacity to 15 million fry annually.	AZERBALYG and SCE.	1	2.00–3.00
Pollution Prevention	Prevent accidental oil spillage into the sea from the Bibi-Hejbat production area.	Build a protective dike at the Bibi-Hejbat oilfield.	Baku municipal authorities.	2	1.50
	Strengthen the pollution monitoring and enforcement system in coastal zones, especially zones affected by the sea level rise.	(i) Develop a plan for interagency coordination for monitoring coastal zones.	Hydromet, SCE, and State Committee on Geology.	1	0.05 mil

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[1] Reproduced from the National Environmental Action Plan (1997) and www.eco.aznet.org

National Environmental Action Plan Priority Environmental Actions[1]
(continued)

Category	Objective	Actions	Responsible Authority	Degree of Priority	Cost Estimate (1997 $ Million)
		(2) Establish international partnerships to model and predict Caspian water level fluctuations.	SCE.	2	0.05 mil
	Strengthen planning tools to minimize future flooding damage on the Absheron Peninsula	Develop hydrodynamic and hydrochemical flooding models for the peninsula.	Ecological Fund, H. Aliyev Environmental Innovations Center, and SCE.	1	0.03 mil
III. Forestry, land, and biodiversity					
Forestry	Increase area occupied by forests, prevent soil erosion, and enhance water quality.	Plant tugai trees along the Kura River flood plain.	AZERLES	1	1.50
Natural Hazards	Protect developed areas, including industrial sites, from severe soil erosion and mudslides.	Engineer retention structures to halt erosion and mudslides.	Committee for Land Improvement and Water Resources and SCE.	1	3.00
Biodiversity Conservation	Improve biodiversity protection.	Develop the National Strategy for Biodiversity and Landscape Preservation.	SCE.	1	0.05

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[1] Reproduced from the National Environmental Action Plan (1997) and www.eco.aznet.org

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National Environmental Action Plan Priority Environmental Actions[1]
(continued)

Category	Objective	Actions	Responsible Authority	Degree of Priority	Cost Estimate (1997 $ Million)
		Rehabilitate and fund the Gyzyl-Agach reserve.	SCE.	1	0.15
		Create two new state reserves: (i) 0rdubad and (ii) Shakhbuz.	SCE and regional administrations.	1 2	0.50
		Establish two new national parks: (i) Shahdag and (ii) Talysh.	CE and regional administrations.	1 2	1.00
	Establish a biodiversity database to protect threatened and endangered species.	Conduct a botanical and forest resources survey.	AZERLES, SCE, and State Committee on Land.	1	0.30
		Update and republish Azerbaijan's Red Book. Develop a joint management plan for protecting endangered species.	SCE, The Greens Movement, Wild Nature Fund.	1	0.03 mil

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[1] Reproduced from the National Environmental Action Plan (1997) and www.eco.aznet.org

National Environmental Action Plan Priority Environmental Actions[1]
(continued)

Category	Objective	Actions	Responsible Authority	Degree of Priority	Cost Estimate (1997 $ Million)
IV. Institutional Development					
	Strengthen the local capacity to carry out environmental monitoring and enforcement.	Update SCE laboratories in Baku, Ganja, Gazakh, Nakhchivan, and Sumgayit.	SCE and State Committee on Land.	1	2.50
	Strengthen regulatory control over pollutants.	Establish a national central registry of potentially toxic chemicals.	SCE and State Committee on Land.	1	0.20
	Develop a computer-assisted analytical capacity for coordinating development planning and environmental protection.	Establish an environmentally oriented geographic information system and database.	SCE and State Committee on Land.	1	0.40
	Improve government staff member expertise in environment protection.	Develop a training program on environmental issues for staff members.	Republican Center for Environmental Education and State Committee on Land.	1	0.10
	Streamline environmental management and monitoring system capabilities.	Integrate existing environmental agencies and establish a unified institute for	Cabinet of ministers.	1	0.05

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[1] Reproduced from the National Environmental Action Plan (1997) and www.eco.aznet.org

National Environmental Action Plan Priority Environmental Actions[1]
(continued)

Category	Objective	Actions	Responsible Authority	Degree of Priority	Cost Estimate (1997 $ Million)
		environmental protection and natural resources control.			
	Expand the geographic scope of SCE.	Restore environmental protection committees in the liberated areas affected by military actions.	SCE.	1	
V. Policy					
Environ-mental Laws	Develop an integrated package of environmental laws.	Review and reform existing laws impacting environmental quality, and pass new laws as needed.	*Milli Mejlis* (The Parliament), SCE, and State Committee on Geology.	1	0.03 mil
Market Incentives	Apply economic tools and incentives to enforce environmental compliance by the public and private sectors.	Introduce an inflation-adjusted system of penalties and fees for public and private enterprises, to regulate compliance with environmental standards.	Ministry of Economy, Ministry of Finance, SCE, and State Tax Inspection.	1	0.02 mil

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[1] Reproduced from the National Environmental Action Plan (1997) and www.eco.aznet.org

National Environmental Action Plan Priority Environmental Actions[1]
(continued)

Category	Objective	Actions	Responsible Authority	Degree of Priority	Cost Estimate (1997 $ Million)
International Compliance	Enhance eligibility for international aid for the environment, and participate more fully in the international community.	Sign and ratify key international environmental conventions.	Milli Mejlis and SCE.	1	0.005 mil
Environmental Compliance	Increase funds allocated for environmental management and protection.	Using international models, establish an environmental fund for pollution prevention and control activities.	Cabinet of ministers.	1	0.001 mil
Privatization	Clarify legal liability for past pollution of the environment.	Amend the environmental laws to define liability for past pollution during privatization.	Milli Mejlis, SCE, and State Property Fund.	1	
	Expand the geographic scope of the SCE.	Restore Environmental Protection Committees in the liberated areas affected by military actions.	SCE.	1	–

— = no data available.
Sources: National Environmental Action Plan (1997) and www.eco.aznet.org.

Appendix 2

Strategic Government Environmental Priorities after 2000

In this appendix, the recommendations of the State Program for Poverty Reduction and Economic Development (SPPRED) 2003–2005 are reproduced. These recommendations refer to environment-related actions considered suitable for support by public funds. SPPRED recommends the following.

1. Clean mercury sludge and improve waste management.
2. Reconstruct water purification and wastewater treatment facilities in Sumgayit, expand water purification facilities in Baku, and construct new facilities in Ganja.
3. Protect traditional sturgeon spawning sections of the Aras and Kura rivers.
4. Treat contaminated water discharges into the Caspian Sea from the Zykh and other storage lakes.
5. Reclaim oil-contaminated land on the Absheron Peninsula.
6. Treat radioactive waste in Neftchala iodine-processing plant, Ramany, and Surakhany.
7. End illegal logging, and reforest 15,500 hectares.
8. Develop alternative energy sources, including geothermal, and formulate a national program for wind and solar power generation.
9. Strengthen environmental protection through improved monitoring of environmental indicators.
10. Carry out administrative reforms to improve environment management.
11. Provide regional environmental laboratories with equipment needed to conduct environment monitoring.

12. Involve municipalities and communities in the environmental impact of economic development projects in their respective areas.
13. Improve waste collection and disposal, and rehabilitate sewerage at the municipal level, using best available technology at affordable cost.
14. Introduce recycling practices.
15. Reduce water and soil contamination.

Appendix 3

Selected Country Environment Indicators

Indicator	1990		2002	
	(unless otherwise stated)		(unless otherwise stated)	
Population				
Population Growth Rate (percent per annum)	2.00		0.80	
Urban Population (million)	3.80		4.20	
Percent of Total	53.90		50.70	
Infant Mortality (per 1,000 live births)	23.00		12.80	(2003)
Life Expectancy at Birth				
Males (years)	71.10		72.30	(2003)
Females (years)	74.80		75.10	(2003)
Energy and Energy Efficiency				
Consumption of Natural Gas Per Capita				
Urban Areas (cubic meters)	377.00		536.00	
Rural Areas	380.00		44.00	
Consumption of Liquefied Gas				
Urban Areas (kilogram)	1.50		3.60	
Rural Areas (kilogram)	9.30		0.90	
Internal Consumption				
Diesel Fuel ('000 tons)	1,259.00		508.00	(2003)
Fuel Oil ('000 tons)	3,237.00		2,317.00	(2003)
Gasoline ('000 tons)	1,284.00		451.00	(2003)
Heat Supply Per Capita in Urban Areas (gigacalorie per annum)	0.90		0.10	
Gross Domestic Product Per Unit of Energy Use (purchasing power parity $ per kilogram of oil equivalent)	—		1.90	
Carbon Dioxide Emissions (million tons)			32.00	(1997)
Tons Per Capita	6.30	(1992)	4.20	(1999)
Water and Sanitation				
Water Supply Per Capita				
Urban Areas (liters per annum)	486.00		334.00	

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Selected Country Environment Indicators
(continued)

Indicator	1990		2002	
	(unless otherwise stated)		(unless otherwise stated)	
Rural Areas (liters per annum)	19.00		6.00	
Urban Population with Access to Safe Water (%)	—		94.20	
Rural Population with Access to Safe Water (%)	—		11.20[a]	
Urban Population with Access to Sanitation (%)	—		90.00	(2000)
Land Use				
Forest Area (million hectares)	10.00	(1995)	10.90	(2000)
Average Annual Deforestation (square kilometer)			130.00[b]	(1990–2000)
% Change			1.30	(1990–2000)
Volume of Timber Harvest ('000 cubic meters)			106.00	58.00
Volume of Fuelwood Harvest (cubic meter)	—		—	
Arable land per capita (ha)	0.55		0.59	
Arable land (% of total land)	50.70		54.90	
Perennial crops (% of total land)	7.90	(1994)	4.80	
Biodiversity and Protected Areas				
Nationally Protected Area ('000 hectares)	372.00		452.00	
Expenditure on Protected Areas (AZM million)	184.00	(1995)	841.00	
% of Total Land	4.00		5.20	

[a] MENR's figure for 2005 was 59.0 percent. The discrepancy with other available estimate is cause by different interpretation of (safe water).

[b] MENR's figure for 2005 was 6.63 square kilometer.

— = not available, kgoe = kilograms of oil equivalent, PPP = purchasing power parity.

Note: Official indicators often vary from field observations and project-level data. For example, the zero use of traditional fuels (reported in the State Statistical Yearbook but not reproduced here) is at odds with the known current reality in remote settlements of Azerbaijan. In any event, the use of a snapshot comparison, such as the one presented here, demands knowledge of the context and would gain by more complete time series comparisons.

Sources: The table is a modified version of one prepared for the Asian Development Bank's Urban Environmental Profile (ADB 2004a). That, in turn, drew on the State Statistical Committee's State Statistical Yearbook 2003; State Program for Poverty Reduction and Economic Development's 2003 annual report; United Nations Development Programme's Azerbaijan Human Development Report 2000 and Azerbaijan Human Development Report 2003; and World Bank's World Development Indicators.

Appendix 4

Selected Environmental Statistics of Azerbaijan

The purpose of this appendix is not to give an extensive statistical picture of the state of the environment but to provide data that support the analysis of the text. The *State Statistical Yearbook of Azerbaijan* and its expanded environment section, annually published by the State Statistical Committee, provides a more comprehensive picture. Also, the Asian Development Bank (2004b) provides extensive data on the water situation and wastewater treatment sector. Tables A4.1–A4.8 examine various factors related to Azerbaijan's environment.

Table A4.1: Generation and Recycling of Toxic Waste (1990–2002)

Item	1990	1995	1998	2000	2002
Generation of Toxic Waste ('000 tons)		27.0	33.9	26.6	9.8
Reuse of Toxic Waste ('000 tons)		25.4	30.5	11.4	0.7

Source: State Statistical Yearbook of Azerbaijan 2004

Table A4.2: Energy Intensity in the South Caucasus, 1995–2001
(ton of oil equivalent/gross domestic product [$ '000,'95 prices])

Country	1995	2001
Armenia	0.58	0.56
Georgia	1.51	0.92
Azerbaijan	5.44	3.10

Note: Comparable 2001 averages were: 0.29 (world), 0.19 (Organisation for Economic Co-operation and Development), 0.65 (Asia), and 1.77 (Commonwealth of Independent States).
Source: World Bank.

Table A4.3: Greenhouse Gas Emissions per Unit of Gross Domestic Product in the South Caucasus
(kilogram of carbon dioxide per dollar of gross domestic product)

Country	1995	2001
Armenia	0.89	1.03
Georgia	1.36	1.44
Azerbaijan	13.08	7.07

Note: Comparable 2001 averages in 2001 were: World: 0.65, OECD: 0.45, Asia: 1.23, CIS: 4.25
Source: Abulashvili (2003), World Bank

Table A4.4: Pattern of Air Pollution (1990–2002)

Item	1990	2000	2002	2003
Total Air Emissions ('0,000 tons)	2,847	908	620	
Stationary Sources	2109	515	217	426
Mobile Sources	738	393	403	
Number of Stationary Sources	13,619	9,364	12,593	
Captured Air Pollutants (stationary sources, '000 tons)	804	111	24	
Captured Air Pollutants (stationary sources, % of total)	28	18	53	

Source: State Statistical Yearbook (Environment Supplement 2003).

Table A4.5: Pattern of Land Use by Selected District

District	Total Area (hectare)	Land Classification (hectare)				Ownership (%)		
		Forest-land	Pasture-land	Arable Land	Other[a]	Government	Municipality	Private
1. Southeast								
Lerik	132,872	35,895	49,402	13,656		54.9	33.2	12.0
Masaly	72,097	16,365	4,484	25,012		31.6	26.3	42.1
Yardimly	72,527	17,260	24,437	12,844		58.7	24.0	17.3
Lenkoran	153,941	29,050	8,391	8,180		82.3	7.6	10.1
Astara	61,643	37,188	5,034	6,109		69.0	12.1	18.9
2. Northeast								
Qusar	187,645	21985	48,034	34,462		48.1	24.5	27.5
3. Northwest								
Belokan	93,447	46,633	7,204	18,443		64.1	9.5	26.4
Zaqatala	134,800	51,157	11,807	25,492		62.6	13.1	24.4
Qakh	149,380	43,751	8,297	19,874		71.5	11.0	17.5
Sheki	243,275	40,160	46,324	71,596		47.6	27.2	26.3
Oguz	107,730	40,891	11,381	19,183		62.4	18.3	19.3

[a] Perennial crops and hayfields.
Source: State Committee for Land and Mapping.

Table A4.6: Areas of Severe Land Degradation in the Caspian Region
(square kilometer)

Country	Degraded Vegetation Cover	Water Erosion	Wind Erosion	Flooding and Salinitya	Techno-genic Factors	Total
Azerbaijan	7,990	2,890	280	3,270	1,180	15,610
Iran	8,970	4,690	70	180		13,910
Kazakhstan	9,660	9.670	9,580	11,320	18,620	58,850
Russia	3,050		13,150	6,920		23,120
Turkmenistan	520	1,990	3,610	6,030	1,800	13,950
Total	30,190	19,240	26,690	27,720	21,600	125,440

[a] Not clear whether the totals refer to area subject to flooding or that is waterlogged or both.
Source: European Union Technical Assistance to Commonwealth of Independent States.

Table A4.7: Lands Subject to Serious Wind Erosion (2003)

District	Total Area (hectare)	Percentage of Total Area Subject to Wind Erosion			
		Moderate	Average	Serious	Total Area Affected (%)
Absheron Peninsula	322,622	24.4	6.6	12.0	43.0
Neftchala	124,069	1.5	1.6	1.3	4.4
Salyan	137,149	10.7	21.0	12.8	44.5
Gobistan	184,750	13.0	13.9	28.7	55.6
Davachi	10,025	1.8	23.4	5.1	30.3
Xachmaz	147,075	1.2	4.0	2.1	7.3
Total	925,690	13.0	11.6	10.2	34.8

Source: State Committee for Land and Mapping.

Table A4.8: Land Erosion Use in Selected Districts (2003)

District	Total Area (hectare)	Land Subject to Erosion (%)			
		Moderate	Average	Serious	Total Affected
1. Southeast					
Lerik	132,872	21.0	21.6	26.7	**69.3**
Masaly	72,097	13.1	10.2	6.9	**30.2**
Yardimly	72,527	15.8	20.5	35.3	**71.6**
Lenkoran	153,941	6.8	7.3	6.1	**20.2**
Astara	61,643	6.2	6.1	7.9	**20.2**
2. Northeast					
Qusar	187,645	33.9	28.6	20.2	**82.7**
3. Northwest					
Belokan	93,447	21.9	16.2	6.3	**44.4**
Zaqatala	134,800	13.9	21.9	14.5	**50.3**
Qakh	149,380	20.0	31.3	30.6	**81.9**
Sheki	243,275	24.5	25.7	31.0	**81.2**
Oguz	107,730	21.8	31.2	23.7	**76.5**

Source: State Committee for Land and Mapping

Appendix 5

Principal Environmental Laws of Azerbaijan

Law on Amelioration and Irrigation, 1996
Law on Protection of Flora, #210, 1996
Law on Chemicals and Pesticides, #294, 1996
Land Code, #217, 1996
Water Code, #418, 1997
Forestry Code, #424, 1997
Law on Public Health, 1997
Law on Radiation Safety of Population, #423, 1997
Law on Underground Resources, #439, 1998
Law on Industrial and Municipal Waste, #514, 1998
Law on Fisheries, #457, 1998
Law on Hydrometeorology, 1998
Law on Environmental Protection, #678, 1999
Law on Access to Public Information, Public Participation in Decision Making and
Access to Justice in Environmental Matters, #736, 1999
Law on Environmental Safety, #674, 1999
Law on Water Supply and Wastewater, #723, 1999
Law on Fauna, #675, 1999
Law on Environmental Safety, 1999
Law on Land Fertility, #778, 1999
Law on Specially Protected Territories and Objects, # 840, 2000
Law on Water Supply and Wastewater, 2000
Law on Protection of Air, #109, 2001
Law on Mandatory Environmental Insurance, 2002
Law on Access to Environmental Information, 2002
Law on Environmental Education, 2002

Appendix 6

Nature Reserves and Conservation of Azerbaijan

Tables A6.1–A6.2 examine Azerbaijan's nature reserves and conservation areas.

Table A6.1: Nature Reserves of Azerbaijan

Name	Area (Hectare)	Ecoregion	Ecosystem	Purpose of Establishment
Ag-Gel	4,400	Kura-Aras	Wetlands and semidesert steppe	Preserve waterfowl and fish populations
Alti-Agach	4,400	Greater Caucasus	90% broadleaved forest	Conservation of ecosystem conservation
Basit-Chay	107	Lesser Caucasus	Riparian forest	Protect a unique grove of ancient plane trees
Gey-Gel	7,131	Lesser Caucasus	60% forest, 40% subalpine and alpine meadows, and wetlands	Conservation of mountain forests and subalpine area of Lesser Caucasus, provision of the purity of water in the Gey-Gel Lake, and preservation of the Eldar pine
Girkan	2,976	Lenkoran-Talysh	Humid subtropical forest	Preserve rare, endemic, and relic flora
Zakatala	25,218	Greater Caucasus	Forests and alpine meadows	Protect and study the fauna and flora of the southern slopes of the Greater Caucasus
Ilisu	9,200	Greater Caucasus	93% is broadleaved forest	Conservation of ecosystem
Ismaili	5,778	Greater Caucasus	Mountain and lowland forest	Conservation of rare and endangered species

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Table A6.1: Nature Reserves of Azerbaijan (continued)

Name	Area (Hectare)	Ecoregion	Ecosystem	Purpose of Establishment
Gara-Gel	300	Lesser Caucasus	High mountain lake	Conservation of lake
Gara-Yaz	4,900	Kura-Aras	Lowland riparian (tugay) forest	Conservation of forest
Kizil-Agach	88,400	Caspian	Wetlands	Conservation of birds (mainly waterfowl)
Pirguli	1,521	Greater Caucasus	85% forest	Conservation of ecosystem
Turian-Chay	12,630	Kura-Aras and Greater Caucasus	Semidesert and arid light forest	Conservation of ecosystem
Shirvan	25,800	Caspian and Kura-Aras	Semidesert meadows and wetlands	Conservation of Persian gazelle, waterfowl, and plants of the Shirvan lowlands

Total Area 191,200 hectares (2.2% of Azerbaijan)

Source: Ministry of Environment and Natural Resources.

Table A6.2: Conservation Areas of Azerbaijan

Name	Area (Hectare)	Ecoregion	Ecosystem	Purpose of Establishment
Gara-Yaz-	17,900	Kura-Aras	Riparian (tugay) forest	Preservation and restoration of mammals and birds
Akstafa Barda	7,600	Kura-Aras	Riparian forest and lowlands	Preservation of game birds
Sheki	9,100	Kura-Aras	Lowlands	Preservation of game birds, mainly pheasants
Glinani island	2,000	Caspian	Wetlands	Preservation of waterfowl and other birds
Byandovan	30,000	Caspian and Kura-Aras	Semidesert meadows and wetlands	Conservation of Persian gazelle,waterfowl, and plants of the Shirvan lowlands
Gerchay	15,000	Kura-Aras	Semidesert meadows and wetlands	Conservation of the Persian gazelle
Lachin	20,000	Lesser Caucasus	Mountain forest andmeadows	Conservation of Bezoar goat (*Capra aegagrus*),bear, wild boar, and wild hare
Gusar	15,000	Greater Caucasus	Foothills and lowlandforest	Conservation of game birds, wild boar, and wild hare
Shankhor	10,000	Kura-Aras	Wetlands	Conservation of game birds and waterfowl
Ag-Gel	7,500	Kura-Aras	Wetlands	Conservation of waterfowl, little bustard, and wild boar
Absheron	800	Caspian	Wetlands	Conservation of waterfowl and Caspian seal
Zuvand	15,000	Talysh	Mountain meadows and forest	Conservation of game birds, bear, leopard, and rare reptiles
Ismaili	40,000	Greater Caucasus	Mountain and lowland forests	Conservation of rare and endangered species
Gubadli	20,000	Lesser Caucasus	Mountain forest andmeadows	Conservation of mammals
Ordubad	40,000	Lesser Caucasus	Treeless mountain plateau	Conservation of mammals
Kizil-Agach	10,700	Lenkoran	Wetlands	Conservation of waterfowl
Kiziljan	5,100	Lesser Caucasus	Mountain forest	Conservation of ecosystem
Dashalti	450	Lesser Caucasus	Forest	Conservation of ecosystem
Arazboyu	2,200	Kura-Araks	Riparian (tugay) forest	Conservation of forest
Gabala	39,700	Greater Caucasus	Forest	Conservation of forest and rare species

Total Area 260,000 ha (2.8% of Azerbaijan)

Source: Ministry of Environment and Natural Resources.

Appendix 7

Azerbaijan's Participation in International Environmental Agreements

Convention	Year Ratified	Focal Point in Azerbaijan (October 2004)
United Nations Convention on Biological Diversity, 1992	2000	Z. Akperov, Academy of Sciences and S. Mamedova, Ministry of Environment and Natural Resources (MENR)
Protection and Use of Transboundary Water Sources and International Lakes (Helsinki Convention)	2000	M. Adigozalova, MENR
Protection of World Cultural and Natural Heritage (World Heritage Convention)	1993	G. Amrachova, MENR
Vienna Convention for the Protection of the Ozone Layer, 1985	1996	I. Abdulov, MENR
Environment Impact Assessment in Transboundary Context (Espoo Convention, 1991)	1991	R. Rzayev, MENR
International Trade in Endangered Species of Wild Fauna and Flora (CITES, 1973)	1998	F. Farzaliyev, MENR
Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters (Aarhus Convention)	1999	F. Aliyev, MENR
United Nations Convention to Combat Desertification	1998	O. Japafarov, MENR
International Convention for the Prevention of Pollution from Ships (MARPOL, 1973 and 1978),	1998	R. Sattaradze, MENR
Convention about Long Distance Transborder Pollution of Atmospheric Air (Geneva Convention, 1979)	2002	B. Qidayatov, MENR
Wetlands of International Importance (RAMSAR, 1971)	2000	A. Najafov, MENR
Control of Transboundary Movements of Hazardous Wastes and Their Disposal (Basel, 1989)	2001	M. Nasibov, MENR
United Nations Framework Convention on Climate Change, 1992	2001	I. Aliyev, MENR
Convention on Long-Range Transboundary Air Pollution, 1979	2002	
Permanent Organic Pollutants (POP) Convention (Stockholm Convention, 2001)	2002	
Cartagena Protocol on Biosafety, 1999	2002	
Teheran Convention	2003	

Note: The table is not meant to be exhaustive. A number of lesser agreements related to environmental management and codes of conduct exist.
Source: Ministry of Environment and Natural Resources.

Appendix 8

Asian Development Bank Assistance for Environmental Management in Azerbaijan (2001–2004)

Technical Assistance
TA 3774-AZE: Urban Water Supply and Sanitation, for $740,000, approved on 15 November 2001.

TA 4301-AZE: Supporting River Basin and Flood Management Planning, for $500,000, approved on 19 December 2003.

Processing:
Capacity Building for Regulatory Reform in Water Supply and Sanitation Sector

Basic Infrastructure Development in Secondary Towns and Communities

Loans
Loan 2068-AZE: Flood Mitigation, $22 million (Asian Development Fund), approved on 19 December 2003.

Processing
Urban Water and Sanitation I, $14.4 (ordinary capital resources)

Appendix 9

Development Partner Assistance to Environmental Management in Azerbaijan (principal post-1996 development partner-funded environment-related activities)

Main Category of Assistance	Project Title and Purpose	Source (Government of Azerbaijan contribution not itemized)
Natural Resource Management	1. Rehabilitation of Azerbaijan Damaged Areas (rehabilitate hydraulic and irrigation facilities and water supply in Aghdam, Fizul, and Terter)	World Bank/United Nations High Commissioner on Refugees/ United Nations Development Programme ($3.9 million, 1997–2002)
	2. Rehabilitation and Improvement of Irrigation and Drainage Infrastructure (counter decline in water supplied to Baku and deterioration of irrigation water supply along the Samur-Absheron Canal; improve drainage and reduce waterlogging and salinity in irrigation areas along the Main Mill-Mugan Collector)	World Bank (International Development Agency) ($46 million loan, 2000–2005)
	3. Irrigation Distribution System and Management Improvement Project (improve effectiveness and financial viability of irrigation water distribution and management for 56,000 hectares through provision of support to water users associations and the State Committee on Amelioration and Irrigation.	World Bank (International Development Agency) ($35 million, 2003)
	4. Irrigation Rehabilitation (rehabilitate Khanarc Canal)	Islamic Development Bank ($9.4 million loan, 2001)
	5. Rural Development Program for Mountainous and Highland Areas (establish Mountain Area Development Authority)	International Fund for Agricultural Development ($19.2 million loan, split between Azerbaijan and Georgia)

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Development Partner Assistance to Environmental Management in Azerbaijan (principal post-1996 development partner-funded environment-related activities) (continued)

Main Category of Assistance	Project Title and Purpose	Source (Government of Azerbaijan contribution not itemized)
	6. National Parks and Natural Resources and Shah-Dag National Park (conservation in Nakhchivan)	World Bank (International Development Agency)/Global Environmental Fund (GEF $1.0 million, 2004–2005)
	7. Ecoregional Nature Protection Program for the Southern Caucasus (support national park establishment in the Northeast [Samur-Yalama area])	Kreditanstalt für Wiederaufbau
	8. Medicinal Plants Project (commercialization as a way of sustainable development in Ismaily)	World Wildlife Fund
	9. Other small conservation projects (leopard protection in Girkan, Karan, and Shirvan national parks, Valtagach)	World Wildlife Fund
	10. Supporting River Basin and Flood Protection	Asian Development Bank (technical assistance, $0.5 million, 2002)
	11. Flood Mitigation (engineering work, flood prevention measures, and watershed protection in Belokan)	Asian Development Bank (loan, $22 million 2003)
	12. Flood Protection (flood protection measures in Sheki-Zakatala region)	European Union Technical Assistance to Commonwealth of Independent States (under technical assistance to Agency for Reconstruction and Rehabilitation of Areas)

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Development Partner Assistance to Environmental Management in Azerbaijan (principal post-1996 development partner-funded environment-related activities) (continued)

Main Category of Assistance	Project Title and Purpose	Source (Government of Azerbaijan contribution not itemized)
	13. Groundwater quality monitoring (conducted a series of advanced workshops (2001) dealing with various aspects of groundwater quality in Azerbaijan and Southern Caucasus)	NATO
	14. Fund for Critical Ecosystem Programs	REC for the Caucasus
Urban Environmental Improvement	1. Greater Baku Water Supply Rehabilitation Project (rehabilitate treatment plants on the Kura and Ceyranbatan and intake and distribution systems)	World Bank/European Bank for Reconstruction and Development, 1995-2005
	2. Preparation of National Water and Wastewater Sector Strategy and Master Plan	Swiss Development Corporation ($5.5 million)
	3. Baku Water Supply (installation of booster water pumps for apartment blocks)	Asian Development Bank (technical assistance, $14.5 million, 2004)
	4. Water Supply and Sanitation (improvement of water supply and sanitation in Agdash, Goychay, and Nalhchivan)	Asian Development Bank (technical assistance, $0.74 million, 2001)
	5. Hospital Water Supply and Treatment (rehabilitate and expand wastewater treatment plant in Baku)	France
	6. Environmental Rehabilitation of Sumgayit (focus on environmental nongovernment organizations, and establish Center for Environmental Rehabilitation of Sumgayit)	United Nations Development Programme, ($0.6 million, 1999)

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Development Partner Assistance to Environmental Management in Azerbaijan (principal post-1996 development partner-funded environment-related activities) (continued)

Main Category of Assistance	Project Title and Purpose	Source (Government of Azerbaijan contribution not itemized)
	7. Imishly Water Restructuring Project (improve water supply in Ganja, Imishly, Nakhchivan, and Sheki through the State Housing Committee)	Kreditanstalt für Wiederaufbau($4.5 million, 2001–2003)
	8. Master Plan of Integrated Environmental Management in Baku City	Japan International Cooperation Agency (2000–2001)
	9. Clean up of Baku Bay (use new technologies to clean Baku Bay and close old oil wells)	Netherlands ($0.6 million, 1998–2000)
	10. Land rehabilitation in Absheron	European Union Technical Assistance to Commonwealth of Independent States
	11. Decontamination of oil-polluted soils in Sumgayit	
	12. National Commitment Building Programs to Phase Out Leaded Gasoline in Azerbaijan, Kazakhstan, and Uzbekistan	NorwayDanish
	13. Regional Study on Cleaner Transport Fuels for Cleaner Air in Central Asia and the Caucasus	Environmental Protection Agency/World Bank(1998–1999)
Clean Production and Control of Industrial Pollution	1. Monitoring System for Baku (improve monitoring and analytical capacity at Baku branch of the State Committee for Environment and Natural Resources for air, water, and soil)	Canadian International Development Agency/ World Bank(1999/2000)
	2. Yenekind Hydropower	Japan International Cooperation Agency (1998)

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Development Partner Assistance to Environmental Management in Azerbaijan (principal post-1996 development partner-funded environment-related activities) (continued)

Main Category of Assistance	Project Title and Purpose	Source (Government of Azerbaijan contribution not itemized)
	3. Rehabilitation of Mingechevir Hydropower Plant	European Bank for Reconstruction and Development (loan, $53.2 million, 1994–2000)
	4. Environmental Protection of Ceyranbatan Dam	European Bank for Reconstruction and Development /Islamic Development Bank/ European Union Technical Assistance to Commonwealth of Independent States ($21 million, 1997–2000 [European Union Technical Assistance to Commonwealth of Independent States under technical assistance to Agency for Reconstruction and Rehabilitation of Areas])
Urban Environmental Improvement	1. Greater Baku Water Supply Rehabilitation Project (rehabilitate treatment plants on the Kura and Ceyranbatan and intake and distribution systems)	World Bank/European Bank for Reconstruction and Development, 1995-2005
	2. Preparation of National Water and Wastewater Sector Strategy and Master Plan	Swiss Development Corporation ($5.5 million)
	3. Baku Water Supply (installation of booster water pumps for apartment blocks)	Asian Development Bank (technical assistance, $14.5 million, 2004)

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Development Partner Assistance to Environmental Management in Azerbaijan (principal post-1996 development partner-funded environment-related activities) (continued)

Main Category of Assistance	Project Title and Purpose	Source (Government of Azerbaijan contribution not itemized)
	4. Water Supply and Sanitation (improvement of water supply and sanitation in Agdash, Goychay, and Nalhchivan)	Asian Development Bank (technical assistance, $0.74 million, 2001)
	5. Hospital Water Supply and Treatment (rehabilitate and expand wastewater treatment plant in Baku)	France
	6. Environmental Rehabilitation of Sumgayit (focus on environmental nongovernment organizations, and establish Center for Environmental Rehabilitation of Sumgayit)	United Nations Development Programme, ($0.6 million, 1999)
	7. Imishly Water Restructuring Project (improve water supply in Ganja, Imishly, Nakhchivan, and Sheki through the State Housing Committee)	Kreditanstalt für Wiederaufbau($4.5 million, 2001–2003)
	8. Master Plan of Integrated Environmental Management in Baku City	Japan International Cooperation Agency (2000–2001)
	9. Clean up of Baku Bay (use new technologies to clean Baku Bay and close old oil wells)	Netherlands ($0.6 million, 1998–2000)
	10. Land rehabilitation in Absheron	European Union Technical Assistance to Commonwealth of Independent States
	11. Decontamination of oil-polluted soils in Sumgayit	NorwayDanish

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Development Partner Assistance to Environmental Management in Azerbaijan (principal post-1996 development partner-funded environment-related activities) (continued)

Main Category of Assistance	Project Title and Purpose	Source (Government of Azerbaijan contribution not itemized)
	12. National Commitment Building Programs to Phase Out Leaded Gasoline in Azerbaijan, Kazakhstan, and Uzbekistan	Environmental Protection Agency/World Bank(1998–1999)
	13. Regional Study on Cleaner Transport Fuels for Cleaner Air in Central Asia and the Caucasus	
Clean Production and Control of Industrial Pollution	1. Monitoring System for Baku (improve monitoring and analytical capacity at Baku branch of the State Committee for Environment and Natural Resources for air, water, and soil)	Canadian International Development Agency/ World Bank(1999/2000)
	2. Yenekind Hydropower	Japan International Cooperation Agency (1998)
	3. Rehabilitation of Mingechevir Hydropower Plant	European Bank for Reconstruction and Development (loan, $53.2 million, 1994–2000)
	4. Environmental Protection of Ceyranbatan Dam	European Bank for Reconstruction and Development /Islamic Development Bank/ European Union Technical Assistance to Commonwealth of Independent States ($21 million, 1997–2000 [European Union Technical Assistance to Commonwealth of Independent States under technical

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Development Partner Assistance to Environmental Management in Azerbaijan (principal post-1996 development partner-funded environment-related activities) (continued)

Main Category of Assistance	Project Title and Purpose	Source (Government of Azerbaijan contribution not itemized)
		assistance to Agency for Reconstruction and Rehabilitation of Areas])
	5. Energy Project (preparation of energy balances prior to transfer of energy matters from Ministry of Economic Development to Ministry of Fuel and Energy)	United Nations Development Programme
	6. Gas Transmission Rehabilitation (part of INOGATE Program)	Kreditanstalt für Wiederaufbau (DM30 million, 1998)
	7. Institutional Support to the Ministry of Fuel and Energy (improved governance of the energy sector)	European Union Technical Assistance to Commonwealth of Independent States (1998–1999)
	8. Power Sector Study	Japan International Cooperation Agency/ Japan Bank for International Cooperation
	9. Transmission Rehabilitation in Baku City	Japan International Cooperation Agency/ Japan Bank for International Cooperation
	10. Energy Saving and Management Centre (established as part of the network of Organizations for the Promotion of Energy Technologies)	European Union Technical Assistance to Commonwealth of Independent States (1999–2003)

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Development Partner Assistance to Environmental Management in Azerbaijan (principal post-1996 development partner-funded environment-related activities) (continued)

Main Category of Assistance	Project Title and Purpose	Source (Government of Azerbaijan contribution not itemized)
	11. Cleaner Production and Energy Efficiency Center	Norway (2003)
	12. National Oil Spill Contingency Plan	European Bank for Reconstruction and Development
Global and Regional Transboundary Environmental Issues	1. Caspian Environmental Program (reverse environmental deterioration in five coastal states) Transboundary Diagnostic Analysis, National Caspian Action Plans, Strategic Action Program (with a public investment program developed), Regional Pollution Control Center, and other projects prepared (treatment of Zykh Lake discharges into the sea, spawning grounds in Kura and Aras rivers, and others).	United Nations Development Programme/Global Environmental Fund/ World Bank/ European Union Technical Assistance to Commonwealth of Independent States
	2. Addressing Transboundary Environmental Issues in the Caspian Environment Program	United Nations Development Programme / United Nations Environment Programme /World Bank
	3. Regional Partnership for Prevention of Transboundary Degradation of the Kura-Aras River (Georgia-based)	United Nations Development Programme/ Global Environmental Fund
	4. First National Communication in Response to United Nations Framework Convention on Climate Change	United Nations Development Programme/ Global Environmental Fund ($0.35 million)

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Development Partner Assistance to Environmental Management in Azerbaijan (principal post-1996 development partner-funded environment-related activities) (continued)

Main Category of Assistance	Project Title and Purpose	Source (Government of Azerbaijan contribution not itemized)
	5. Expedited Financing of Climate Change Enabling Activities (Phase II)	United Nations Development Programme/ Global Environmental Fund ($0.1 million)
	6. Program for Phasing Out Ozone Depleting Substances	United Nations Development Programme/United Nations Environment Programme/Global Environmental Fund ($6.9 million)
	7. Biodiversity National Report and Strategy	United Nations Development Programme/Global Environmental Fund ($0.35 million)
	8. Water Management in the South Caucasus (demonstrate the process of integrated river basin planning at the local level and focus on capacity building in the region and four Azerbaijan districts [, Balaken, Kakh, Sheki, and Zagatala)	United States Agency for International Development (2002)
	9. Kura-Aras River Basin Transboundary Monitoring	European Union Technical Assistance to Commonwealth of Independent States (2002–2003)
	10. Cooperative River Monitoring (three Southern Caucasus countries involved)	NATO/Organization for Security and Co-operation in Europe (2002)

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Development Partner Assistance to Environmental Management in Azerbaijan (principal post-1996 development partner-funded environment-related activities) (continued)

Main Category of Assistance	Project Title and Purpose	Source (Government of Azerbaijan contribution not itemized)
	11. Climate Change Fund (small grants for South Caucasus Cooperation Program [United Nations Framework Convention on Climate Change-related])	Canadian International Development Agency
	12. Capacity Building for Improving the Quality of	Eurasia Foundation
	13. Greenhouse Gas Inventories (regional project)	Global Environmental Fund (2002–2006)
Environmental Policy Development	1. Support also for Roi+10 Report	United Nations Development Programme
	2. Support for Aarhus Convention at Ministry of Environment and Natural Resources	European Union Technical Assistance to Commonwealth of Independent States
	3. Environmental monitoring	United Nations Economic Commission for Europe/European Environment Agency
	4. Small projects supporting civil society's involvement in environmental debate	Initiative for Social Action and Renewal in Eurasia
Multicom-ponent	1. Urgent Environmental Improvement Project(pilot mercury and on-shore oil cleanup, hatchery rehabilitation, and institutional support)	World Bank, $23.5
	2. Community Development	United States Agency for International Development

Note: Lists of this kind are inevitably open to criticism of incompleteness and bias. The first is a matter of (i) not listing small environmental activities (too numerous to itemize) that were components of larger projects not mainly targeting the environment (e.g., refugee assistance projects of the mid-1990s, some environmental activities under community development projects funded by the United States Agency for International Development, or the private sector) and (ii) incomplete accounting of small environmental initiatives funded by international nongovernment organizations in Azerbaijan that, taken together, represent a significant infusion of assistance. The second is a matter of deciding which activities to consider "environment-related." It could be argued, for instance, that creation of institutional preconditions for increased agricultural productivity (e.g., land reform) is every bit as "environmental" as, say, salinity control. If so, another large element of assistance would deserve to be added, in this case mentioned projects such as European Union Technical Assistance to Commonwealth of Independent States' 1996 Cadastre and Land Registration Project, World Bank's 1996 Farm Privatization Project and Agrarian Development and Rural Credit Project , 1999 European Union-funded RESAL (European Food Security Network), and others.
Source: Government of Azerbaijan.

Appendix 10

Country Environmental Analysis Consultation Process

A. Consultation with Environmental Nongovernment Organizations

(Venue: Regional Environmental Center, Baku, 28 July 2004)

Nongovernment Organizations Present and their Representatives:

1. Ecograf, G.B. Kozlova, telephone: (+99 412) 630756
2. *Bizler Namine* (For Us), S. Heydarova, telephone: 98-55-64
3. *Bizim Umumi Evimiz* (Our Common Home) N. Voronina, telephone: 76-23-59; Suleyman Suleymanov, telephone: 764745, mobile phone: 3715244; and

   A. Dalxanov, telephone: 915225 and 918811
4. Caucasus Environmental NGO Network, E. Sardarov, mobile phone: 225-25-45

   (also representing Saniya (A Second)
5. ECORES (Environmental Analytic Information Agency), R. Verdiyev, telephone: 335687, mobile phone: 3495884
6. Ecological Innovation Center, A. A. Abdulla-Zade, telephone: 974626, mobile phone: 3234411
7. Caucasus NGO Confederation, I. Isamyilov, telephone: 973867 (also representing Humans and Environment)
8. Azerbaijan Voluntary Society of Engineers, A. I. Akhmedov Oglu, telephone: 407259
9. International Ecoenergy Academy, S. Movsumov, telephone: 382370, mobile phone: 6484499
10. Pilgrim, Y. A. Vaayev, telephone: 405819

11. Children Environmental Union (Our House), F. Amirova, telephone: 764745
12. Ecoscope, C. Shabanova, telephone: 937397, mobile phone: 3993755
13. *Ruzgar* (Wind), K.M. Yakubov, telephone: 394113
14. Yezin Dostlun, F. Cefaro, telephone: 949572
15. World Wildlife Fund Caucasus, S. Almuzadova, telephone: 974972/73
16. Mercy Corps, C. Mammadov, telephone: 975172
17. Greens' Movement, F. Huseynova, mobile phone: 3299391
18. Regional Environmental Center of the Caucasus, I. Kangarli, telephone: 963936.

B. Consultation with Government Agencies and Development Partners

(Venue: Asian Development Bank Resident Mission, 15 November 2004)

List of Participants

Name	Organization	Function
1. I. Abdulo	Ministry of Environment and Natural Resources	Deputy Head of the Department of Environmental Policy and Environmental Protection
2. I. Aliyev	Ministry of Environment and Natural Resources	Head of the Department of International Cooperation, Internal Affairs, Information and Propaganda
3. A. Orujov	Ministry of Environment and Natural Resources	Adviser to the Minister
4. C. Salehli	Ministry of Fuel and Energy	Head of the Environmental Protection Division
5. Y. Bagirli	State Committee for Construction and Architecture	Head of the Department of Urbanization
6. M. Asadov	Committee of Land Improvement and Irrigation	Head of the Environment Protection Management Division
7. R. Mahmudov	Ministry of Economic Development	Head of the Environment Protection Department
8. B. Jafarov	State Committee for Land and Mapping	Consultant
9. L. Tagizade	Ministry of Health	Head of the Department of Environment Protection
10. A. Alekperov	National Coordinating Unit for the European Union Technical Assistance in Azerbaijan	Executive Director
11. J. Ibrahimova	United Nations Development Programme	Senior Program Adviser

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