

STATE COMMITTEE ON ECOLOGY AND NATURE UTILISATION CONTROL  
BAKU COMMITTEE ON ECOLOGY AND NATURE UTILISATION CONTROL  
AZERBAIJAN REPUBLIC

**THE MASTER PLAN STUDY  
ON  
INTEGRATED ENVIRONMENTAL  
MANAGEMENT  
IN  
BAKU CITY  
IN  
AZERBAIJAN REPUBLIC**

**FINAL REPORT  
VOLUME I**

**EXECUTIVE SUMMARY**

**MARCH 2001**

**KOKUSAI KOGYO CO., LTD.**

S S S
-------

J R
-----

01-42
-------

## PREFACE

In response to a request from the Government of Azerbaijan Republic, the Government of Japan decided to conduct The Master Plan Study on Integrated Environmental Management in Baku City in Azerbaijan Republic and entrusted the study to the Japan International Cooperation Agency (JICA).

JICA selected and dispatched a study team headed by Mr. Susumu Shimura, Kokusai Kogyo Co., Ltd. to Azerbaijan, three times between January 2000 to March 2001. In addition, JICA set up an advisory committee headed by Mr. Masahiro Ohta, a senior adviser on environmental policy development of the Institute for International Cooperation of JICA, which examined the study from specialist and technical points of view.

The team held discussions with the officials concerned of the Government of Azerbaijan, and conducted field surveys at the study area. Upon returning to Japan, the team conducted further studies and prepared this final report.

I hope that this report will contribute to the promotion of this project and to the enhancement of friendly relationship between our two countries.

Finally, I wish to express my sincere appreciation to the officials concerned of the Government of the Azerbaijan Republic for their close cooperation extended to the study.

March, 2001



---

Kunihiko Saito

President

Japan International Cooperation Agency

March 2001

Mr. Kunihiko Saito  
President  
Japan International Co-operation Agency

### Letter of Transmittal

Dear Mr. Saito,

It is our pleasure to submit to you the report on the Master Plan Study on Integrated Environmental Management in Baku City in Azerbaijan Republic.

The report consists of three components: the study on the current Environmental Management (EM); the formulation of the EM Master Plan (M/P) until the year 2010; and the formulation of the implementation programme for priority projects.

During the study on the current EM, seven field investigations were conducted, and existing data and information of various sources were collected and examined. By doing so, the current status of EM in Baku City was thoroughly understood, and the key environmental issues were identified.

The M/P was formulated with the principal goal of "contributing to the sustainable growth of Baku City with due attention to the environment, by the target year 2010". To achieve this, the M/P was formulated aiming for the development of an EM policy framework and the enhancement of capacity to enforce the EM policy framework in Baku City.

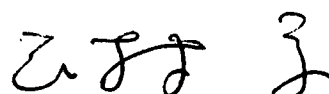
The implementation programme was formulated on six priority projects that should be implemented from 2001 to 2003: development of environmental data management; institutional capacity building for the BCE; development of environmental monitoring system; development of nature conservation system; development of illegal dumping control system; and development of supervision and support system for M/P formulation of municipal solid waste and waste recycling. From the technical, the social, the financial, and the economical assessments of these projects, we concluded that they would be viable and sound in every aspect.

During the study we conducted two pilot projects with the close co-operation of the Azeri counterparts in order to identify and to overcome the difficulties that may arise in the realisation of the M/P: experiment on enhancement of the BCE laboratory; and experiment on development of illegal dump control system. We also held seminars on technology transfer to publicise the results of the study. These activities were reported in the local media, and attracted much attention from the general public.

We would like to take this opportunity to express our sincere gratitude to your Agency, the Ministry of Foreign Affairs, and the Ministry of Environment of Japan. We would also like to extend our deep appreciation to the Cabinet of Ministers and Ministry of Foreign Affairs of Azerbaijan, SCE and BCE, and the Embassy of Japan for their vital co-operation during the implementation of our study in the Republic of Azerbaijan.

Last but not least, we hope that the output of our study presented here will contribute to the improvement of EM and the sustainable growth of Baku City.

Respectfully,



---

Susumu Shimura  
Team Leader  
Master Plan Study on Integrated  
Environmental Management in Baku  
City in Azerbaijan Republic

# OUTLINES OF THE PLAN

## 1 Background

Full-scale industrial development based on the rich oil resources in Baku, the capital of Azerbaijan, and its surroundings started in the latter half of the 19th century, and the Baku oil field was the largest in the world at the beginning of the 20th century. The technology used for more than one century, however, lacks attention to the environment and keeps affecting all environmental media. After independence, a wide range of environmental damage began to be identified, including the accumulation of toxic substances in the abandoned oil field and aged industrial zones, health impacts and the loss of natural resources.

Given these conditions, the government of Azerbaijan requested a master plan (M/P) on integrated environmental management in Baku to be drawn up. In response, the Japan International Cooperation Agency (JICA), Japan's technical assistance implementing agency, decided to implement the study in close cooperation with the relevant authorities of the government of Azerbaijan.

## 2 Objectives of the Study

The study aimed to achieve the following objectives:

1. Formulate a M/P on integrated environmental management for Baku city for the target year 2010 and implementation programmes for the selected priority projects.
2. Pursue technology transfer on developing the M/P by means of joint work between the counterpart personnel and the Japanese study team.

## 3 Content of the Study

During the study on the current Environmental Management (EM), seven field investigations were conducted, and existing data and information of various sources were collected and examined. By doing so, the current status of EM in Baku City was thoroughly understood, and the key environmental issues were identified.

The M/P was formulated with the principal goal of "contributing to the sustainable growth of Baku City with due attention to the environment, by the target year 2010". To achieve this, the M/P was formulated aiming for the development of an EM policy framework and the enhancement of capacity to enforce the EM policy framework in Baku City.

At present, the city development plan of Baku City is under preparation and there is no clear development policy of city planning yet. The drive for economic development and control of excessive urbanisation must be balanced, but no criteria are given for rational decision making. For the promotion of city development with due attention to the environment, the city development plan has to be formulated as soon as possible.

In the absence of a city plan, the team elaborated an environmental zoning plan which aims at environmental land use. Environmental zoning is a powerful means of guiding sound development and protecting the natural environment provided only if it is properly enforced.

The acquisition of reliable data is essential to understand the environmental conditions and formulate appropriate environmental improvement plans. The environmental GIS database established in the present study is an instrument to integrate environmental data scattered across different organisations, and to share those among not only policy planners but also all the citizens

## **4 Evaluation of Priority Project**

The implementation programme was formulated on six priority projects that should be implemented from 2001 to 2003:

- 1) Development of environmental data management;
- 2) Institutional capacity building for the BCE;
- 3) Development of environmental monitoring system;
- 4) Development of nature conservation system;
- 5) Development of illegal dumping control system;
- 6) Development of supervision and support system for M/P formulation of municipal solid waste and waste recycling.

FIRR was calculated at  $-2.6\%$ . The team therefore concludes that investment into the priority projects using a loan will result in financial difficulties.

The quantification of environmental benefits is in general difficult and is often attempted only arbitrarily. The team attempted EIRR calculation only taking account of benefits from (i) prevention of infectious and respiratory diseases and (ii) contribution of improved city beauty to tourism industry development. EIRR is calculated at  $15.2\%$ . It is well above the threshold value of  $8.0\%$  used by the WB and EBRD (European bank for reconstruction and development) in decision making of financing. Furthermore, there should be other large benefits such as timely decision making using the GIS database and increased opportunity to have contact with nature in Absheron Sanctuary, although they are not quantified. The team concluded that all the priority projects are reasonable and recommendable in technical, social, financial and economic terms.

During the study we conducted two pilot projects with the close co-operation of the Azeri counterparts in order to identify and to overcome the difficulties that may arise in the realisation of the M/P: experiment on enhancement of the BCE laboratory; and experiment on development of illegal dump control system.

## 5 Recommendations

### 1) Promotion of City Development with Due Attention to the Environment

The team elaborated an environmental zoning plan which aims at environmental land use. The team strongly urges the relevant authority to develop a city land use plan incorporating the proposed environmental zoning and officially approve the plan for practical enforcement.

### 2) M/P Formulation for the Management of Municipal Solid Waste and Medical Waste

Municipal solid waste management is laid aside without a M/P or any other form of improvement strategies, although the problems associated with municipal solid waste are diverse, including insufficient waste collection services, non-sanitary final disposal and innumerable illegal dumps

A M/P for the management of municipal solid waste including non-hazardous industrial waste must be therefore immediately worked out in order to resolve such problems. The BCE should give advises and assistance to BEP.

### 3) Enhancement of the Monitoring System

The surveys by the team revealed, however, that the quality of lake water and sediment is partly poor and air quality is threatened by vehicles, 70% of which were found to emit CO exceeding the standard. Therefore, the BCE, with assistance of the SCE, has to enhance its monitoring system

### 4) Institutional Building of the BCE

Improvement is required in every aspect for institutional building of the BCE. Particularly, the BCE has to obtain tools for law and develop a data management system, and its salary level has to be raised to motivate the BCE personnel.

### 5) Integration and Sharing of Environmental Data

The environmental GIS database established in the present study is an instrument to integrate environmental data and to share those among not only policy planners but also all the citizens. The BCE and the SCE have to keep the database updated and make the database more useful for their work execution

### 6) Effective Use of the Study Products

The BCE has to learn practical skills of environmental management in the field. In the present study, therefore, the team carried out a number of field investigations and pilot projects, through which the BCE gained practical experiences of environmental management. Experience learnt by the BCE from the study should be valuable and the BCE is expected to utilise it fully for the realisation of the M/P.

### 7) Financial Arrangement for M/P Implementation

The current financial sources of the BCE are the general budget from the central government through the SCE and the “off-budget” which the BCE earns by itself.

O&M cost should be covered by the general This is set as a final target of the financial M/P. For investment, in Phase I, finance must be sought from international or

bilateral aid agencies. In Phase III, the Oil Fund should be also partly allocated as investment fund for the M/P.

### **8) Implementation of Priority Projects**

The BCE is strongly recommended to implement the priority projects immediately as a first step toward the M/P. Securing investment fund from overseas is the first inevitable question to be resolved.

### **9) Public Awareness Raising**

The BCE has to seriously work on public awareness raising. The BCE is strongly recommended to make the best use of the experiences obtained during the campaign to tackle this challenging task.

### **10) Monitoring of M/P Implementation**

The BCE should not leave the M/P as a plan drawn on paper but bring it into effect steadily. The team recommends the BCE to develop a system to monitor the progress of the M/P.

- a monitoring team should be formulated within the BCE headed by the BCE chairman;
- the BCE chairman should submit a M/P monitoring report to the SCE chairman (or the Minister of Environmental Protection, if the SCE is transformed to a Ministry) every year. After review and approval by the SCE chairman (or the Minister), Cabinet of Ministers and the Parliament, the report should be publicised;
- the report should describe the progress of the environmental projects to be undertaken by other organisations as well as the progress of the M/P itself (i.e. improvement of the BCE/SCE). It should also state accomplished environmental improvements as quantitatively as possible;

# The Study on Integrated Environmental Management in Baku City in Azerbaijan Republic

## List of Volumes

Volume I	Executive Summary
Volume II	Main Report
Volume III	Supporting Report
Volume IV	Data Book

All the volumes are also available in Russian.

***This is the Executive Summary.***

In this report, the project cost is estimated by using the price as of the end of October 2000 and the exchange rate of US\$ 1.00 = 108.30 Japanese Yen = 4550 Manat.





Location of the Study Area

## CONTENTS

Preface	
Letter of Transmittal	
Outlines of the Plan	
List of Volumes	
Location of the Study Area	
Plates	
	Page:
<b>1</b>	<b>Introduction</b> <b>1</b>
1.1	Background..... 1
1.2	Scope of the Study ..... 1
1.2.1	Objectives of the Study ..... 1
1.2.2	Study Area ..... 2
1.3	Policies of the Study ..... 2
1.4	Work Schedule ..... 2
1.5	Study Organisation..... 4
<b>2</b>	<b>Current Environmental Management of the Study Area</b> <b>5</b>
2.1	Profile of the Study Area..... 5
2.1.1	Administration..... 5
2.1.2	Natural Environment..... 5
2.1.3	Land Use ..... 6
2.1.4	Socio-economic Conditions in Baku ..... 6
2.1.5	Urban Services..... 7
2.2	Important Findings in Field Investigations ..... 8
2.2.1	Mobile Pollution Source Survey..... 8
2.2.2	Factories (point pollution sources) survey ..... 9
2.2.3	Environmental Quality Survey ..... 10
2.2.4	Opinion survey for medical institutions ..... 10
2.2.5	Public opinion survey (POS)..... 11
2.2.6	Waste amount and composition survey (WACS)..... 11
2.2.7	Survey on recycling activities ..... 13
2.3	Key Environmental Issues..... 13
2.3.1	Environmental Status ..... 13
2.3.2	Environmental Policy..... 14
2.3.3	Environmental Institution..... 14
2.3.4	Technical Management ..... 17

<b>3</b>	<b>Environmental Management Master Plan</b>	<b>37</b>
3.1	Master Plan Framework .....	37
3.1.1	Scio-economic Framework.....	37
3.1.2	Master Plan Framework .....	40
3.2	Environmental Management Master Plan .....	51
3.2.1	Air Protection .....	52
3.2.2	Water Resources Protection .....	53
3.2.3	Land Protection and Waste Control.....	55
3.2.4	Fauna and Flora Protection and Conservation Areas Management.....	60
3.2.5	Laboratory (Chemical Analysis).....	66
3.2.6	Food Environment Control.....	67
3.2.7	EIA .....	69
3.2.8	Information .....	70
3.2.9	Administration Department .....	73
3.2.10	Financial Management .....	75
3.2.11	Personnel Plan .....	78
3.3	Implementation Plan and Evaluation of the Master Plan.....	78
3.3.1	Implementation and Investment Plan.....	78
3.3.2	Financial Planning and Evaluation .....	80
<b>4</b>	<b>Implementation Programme for Priority Projects</b>	<b>86</b>
4.1	Pilot Projects.....	86
4.1.1	Plan of Pilot Project .....	86
4.1.2	Experiment on Enhancement of the BCE Laboratory .....	87
4.1.3	Experiment on Development of Illegal Dump Control System .....	88
4.2	Priority Projects .....	90
4.2.1	Plan of Priority Projects .....	90
4.2.2	Project Evaluation.....	94
<b>5</b>	<b>Conclusions and Recommendations</b>	<b>105</b>

## List of Tables

	Page:
Table 2-1: Number of Refugees and Internally Displaced Population by District, 1999.....	6
Table 2-2: Waste Composition in 2000 and 2010.....	13
Table 3-1: Baku Population Projection.....	37
Table 3-2: Economic Development Forecast.....	38
Table 3-3: Industrial Structure in 2010.....	38
Table 3-4: Predicted Pollution Loads .....	39
Table 3-5: Proposed Targets for Each Environmental Sector.....	42
Table 3-6: Environmental Zoning Proposal.....	45
Table 3-7: Personnel Plan .....	78
Table 3-8: Investment Plan .....	79
Table 3-9: The Investment Costs for Master Plan.....	80
Table 3-10: The O&M Costs for the Master Plan.....	80
Table 3-11: Assumed Amount of National General Budget and Oil Fund .....	81
Table 3-12: EPF Charges .....	81
Table 3-13: BCE Budget from National General Budget and its Share.....	82
Table 3-14: Revenue Plan of Off Budget .....	82
Table 3-15: Changes of Personnel Costs .....	83
Table 3-16: Calculation Results by Alternatives.....	84
Table 4-1: Descriptions and Responsibilities of the Project.....	87
Table 4-2: Work Division of Experiment .....	88
Table 4-3: Plan of Priority Projects.....	91
Table 4-4: Cost Schedule of the Priority Projects .....	94
Table 4-5: Major Assumptions of Financial Evaluation.....	98
Table 4-6: Revenue of Off Budget .....	99
Table 4-7: Investment Costs for Financial Evaluation.....	100
Table 4-8: Life Span by Facilities and Equipment.....	100
Table 4-9: Personnel Costs for Financial Evaluation.....	101
Table 4-10: Other O&M Costs.....	101
Table 4-11: Result of IRR Calculation .....	101
Table 4-12: Assumed Benefit.....	103
Table 4-13: Conversion Factors for Economic Evaluation .....	103
Table 4-14: Assumed Costs for Investment.....	103
Table 4-15 Assumed O&M Costs .....	104
Table 5-1: Study Products and Their Expected Use.....	107
Table 5-2: Preconditions of Financial Arrangement for M/P Implementation.....	108

## List of Figures

	Page:
Figure 1-1: Study Area .....	3
Figure 2-1: Waste Stream in 2000.....	12
Figure 2-2: Waste Stream in 2010.....	12
Figure 2-3: Function of the Central Laboratory and Relationship with the BCE .....	19
Figure 2-4: Tasks and Problems of the BCE Fauna Protection Works .....	29
Figure 2-5: Problem Tree of Flora Protection.....	30
Figure 2-6: Series of Actions Involved in the GIS.....	34
Figure 2-7: Food, Environment and BCE/SCE.....	35
Figure 3-1: BCE Transition to Ministry Branch Office .....	50
Figure 3-2: Yearly Expenditure.....	83
Figure 3-3: Cash Flow in Case L-2 .....	85

## LIST OF ABBREVIATIONS

ARWC	Absheron Regional Water Company
BCE	Baku Committee on Ecology and Nature Utilisation Control
BEP	Baku Executive Power
CAWF	Committee of Amelioration and Water Farm
COM	Cabinet of Ministers
C/P	Counter Part
CPT	Cleaner Production Technology
DF/R	Draft Final Report
EIA	Environmental Impact Assessment
EIRR	Economic Internal Rate of Return
EM M/P	Environmental Management Master Plan
EP	Executive Power
EPF	Environmental Protection Fund
EU	European Union
FIRR	Financial Internal Rate of Return
F/R	Final Report
FSU	Former Soviet Union
GDP	Gross Domestic Product
GIS	Geographical Information System
GoAz	Government of Azerbaijan
GRDP	Gross Regional Domestic Product
HWM	Hazardous waste management
Hydromet	State Committee for Hydro-meteorology
IC/R	Inception Report
IDP	Internally Displaced Persons
IT/R	Interim Report
JICA	Japan International Cooperation Agency
MOEP	Ministry of Environmental Protection
M/M	Minutes of Meetings
MOH	Ministry of Health
M/P	Master Plan
MSW	Municipal Solid Waste
MSWM	Municipal Solid Waste Management
NEAP	National Environmental Action Plan
NGO	Non-governmental Organisation
O&M	Operation and Maintenance
PIU	Project Implementation Unit
POS	Public Opinion Survey
P/R	Progress Report
PPP	Polluters Pay Principle

PVI	Physical Volume Index
SCMS	State Committee for Mining Supervision
SCE	State Committee on Ecology and Nature Utilisation Control
SOCAR	State Oil Company of Azerbaijan Republic
S/W	Scope of Work
Tacis	Technical Assistance programme for the Commonwealth of Independent States
UEIP	Urgent Environmental Investment Project
UNDP	United Nations Development Programme
UPA	UP Azerbaijan
VOC	Volatile Organic Compound
WACS	Waste Amount and Composition Survey
WB	The World Bank
WTP	Willingness to Pay