

Lao People's Democratic Republic

THE STUDY
ON
THE SOLID WASTE MANAGEMENT
SYSTEM IMPROVEMENT PROJECT
IN VIENTIANE

FINAL REPORT
VOLUME I. MAIN REPORT

AUGUST 1992

Japan International Cooperation Agency (JICA)

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Lao People's Democratic Republic

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PREFACE

In response to a request from the Government of Lao People's Democratic Republic, the Government of Japan decided to conduct a study on the Solid Waste Management System Improvement Project in Vientiane and entrusted the study to the Japan International Cooperation Agency (JICA).

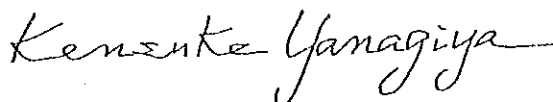
JICA sent to Lao P.D.R. a study team headed by Mr. Takao Yoshida, Kokusai Kogyo Co., Ltd., 3 times between October 1991 and June 1992.

The team held discussions with the officials concerned of the Government of Lao P.D.R., and conducted field surveys at the study area. After the team returned to Japan, further studies were made and the present report was prepared.

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

I wish to express my sincere appreciation to the officials concerned of the Government of Lao People's Democratic Republic for their close cooperation extended to the team.

August 1992



Kensuke Yanagiya

President

Japan International Cooperation Agency

**THE STUDY ON THE SOLID WASTE MANAGEMENT
SYSTEM IMPROVEMENT PROJECT IN VIENTIANE**

LIST OF VOLUMES

EXECUTIVE SUMMARY

VOLUME I. MAIN REPORT

VOLUME II. SUPPORTING REPORT (1); PRESENT SOLID WASTE MANAGEMENT

- Appendix A. Profile of the Study Area
- Appendix B. Waste Amount and Composition Survey
- Appendix C. Community Consciousness Survey
- Appendix D. Investigation of Km 18-DS, DCDS and NCDS
- Appendix E. Other Field Survey
- Appendix F. Present Solid Waste Management
- Appendix G. Evaluation of Present Solid Waste Management

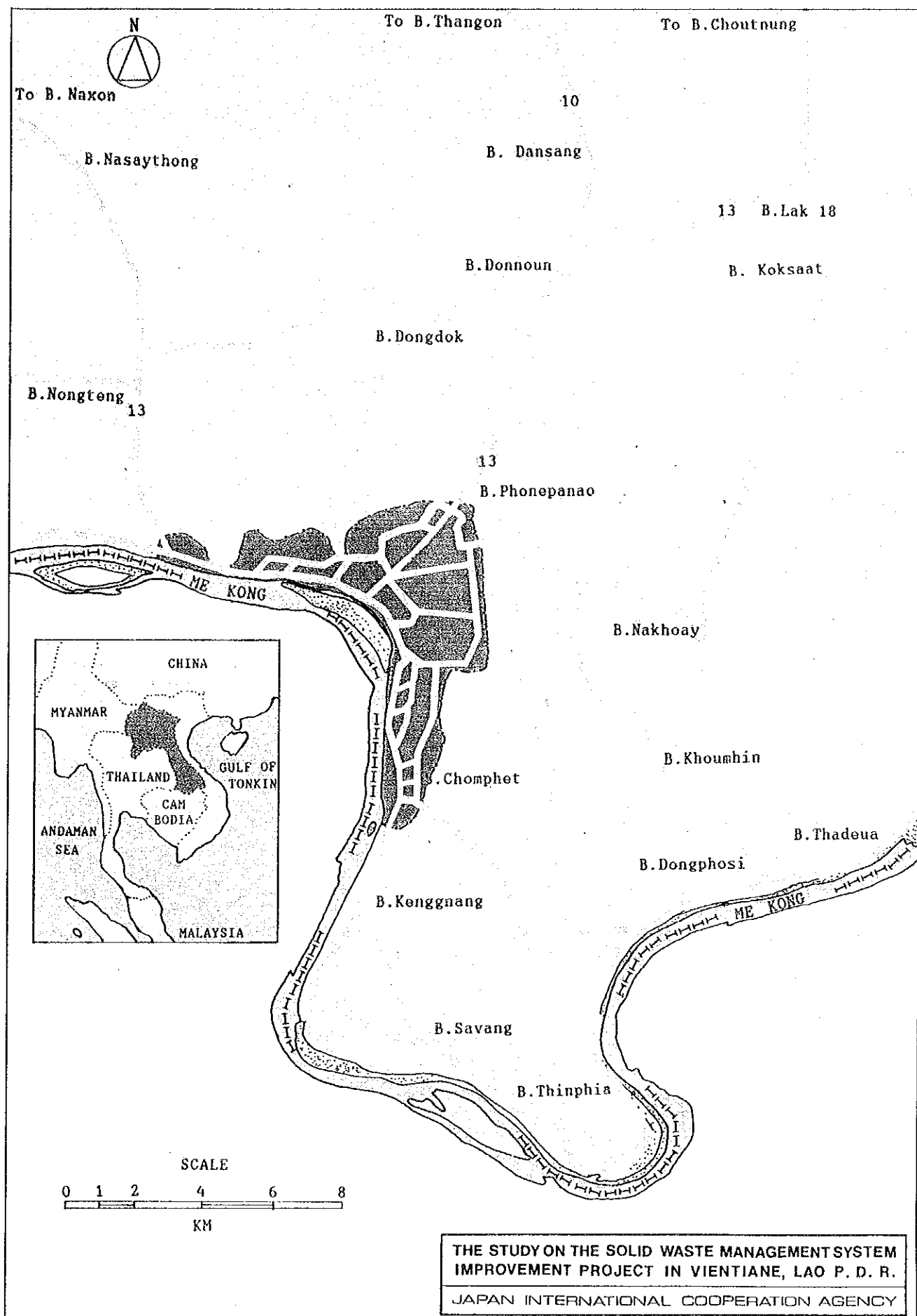
VOLUME III. SUPPORTING REPORT (2); BASIC PLAN

- Appendix H. Planning Frameworks for a Basic Plan
- Appendix I. Selection of an Optimum Alternative
for Technical System
- Appendix J. Outline of the Basic Plan

VOLUME IV. SUPPORTING REPORT (3); FEASIBILITY STUDY

- Appendix K. Immediate Improvement Needs and Plan
- Appendix L. Collection Experiment
- Appendix M. Experiment on Sanitary Landfill Operation
- Appendix N. Feasibility Study of the First Priority Project

This is VOLUME I MAIN REPORT



Location Map

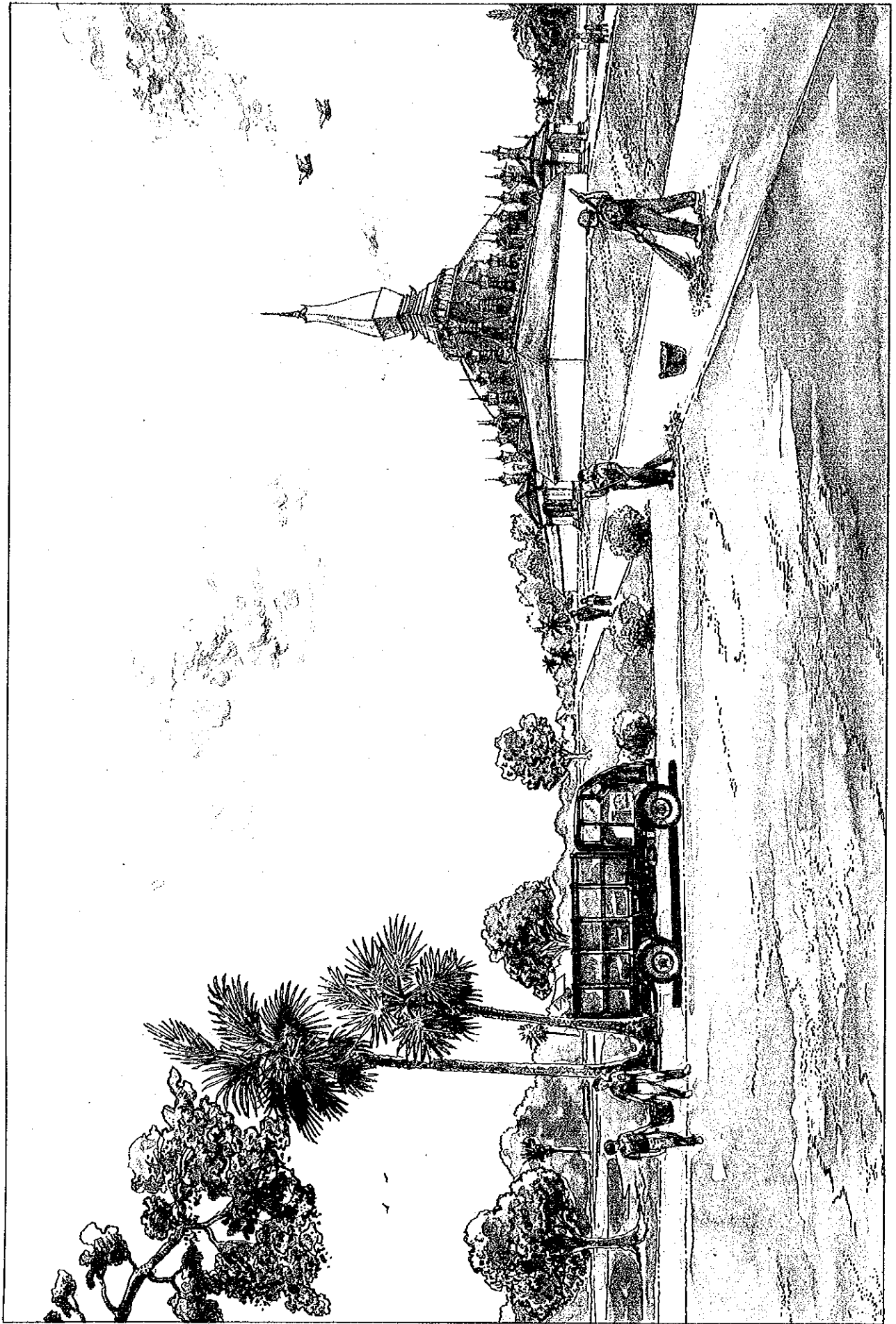


Plate 1. Image of Clean Vientiane

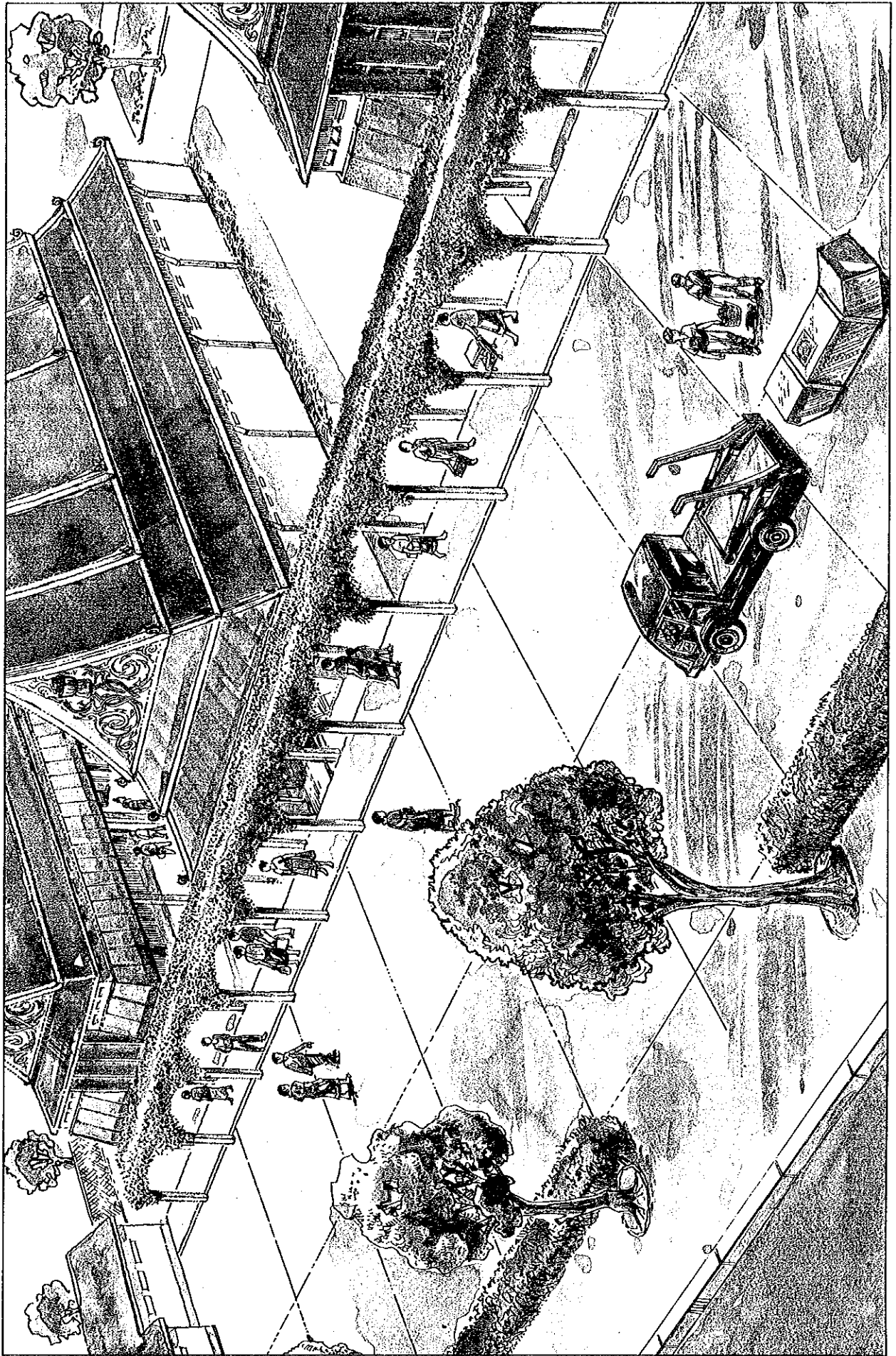


Plate 2. Image of Improved Collection System

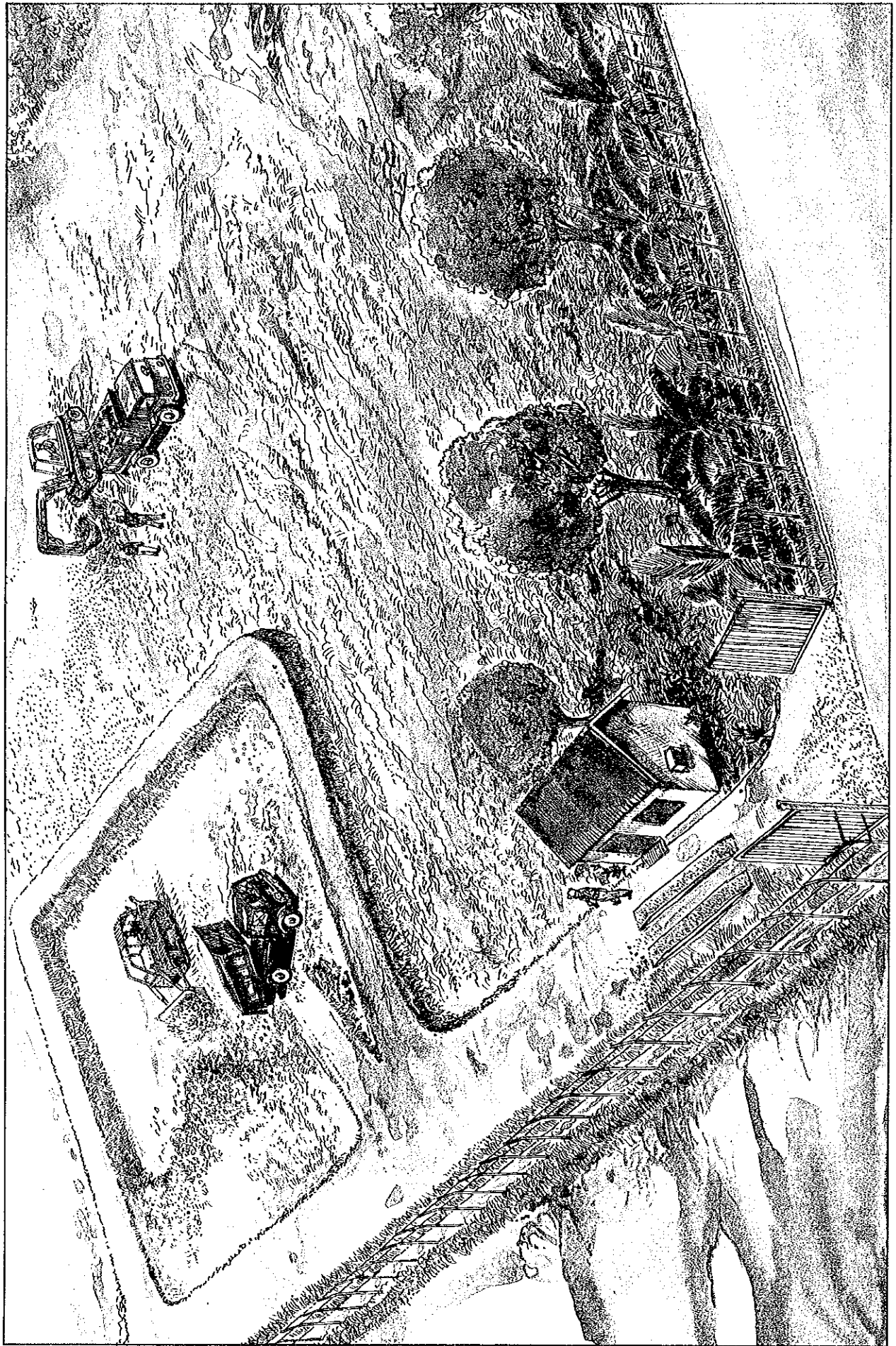
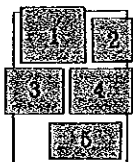


Plate 3. Image of Sanitary Landfill at KM 18-DS



- 1 Scattered waste along the road is commonly seen in Vientiane
- 2 Collection is conducted by private contractors
- 3 Waste self disposed by residents
- 4 DCTC collection vehicle undergoing repair during operation
- 5 KM 18 disposal site



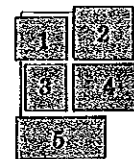
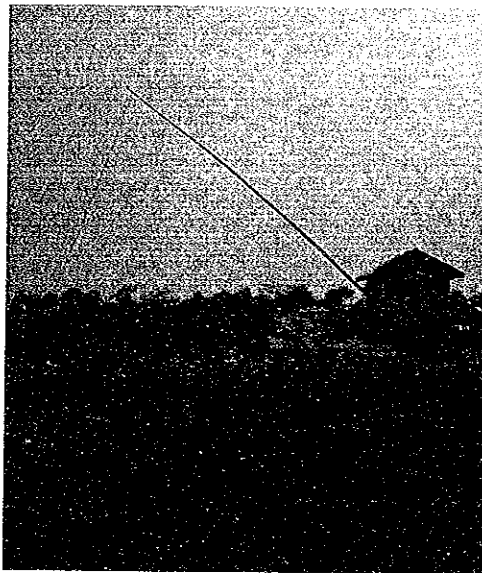
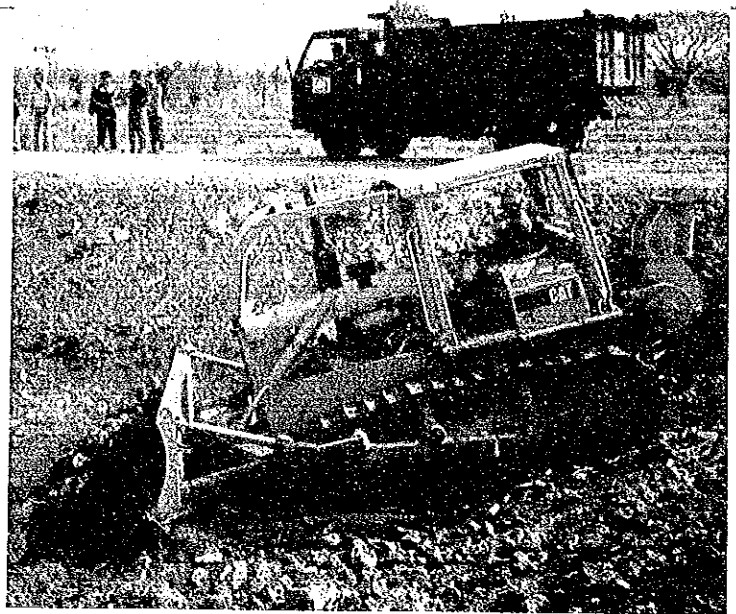
Plate 4. Present Solid Waste Management



- 1 Opening Ceremony of Collection Experiment
- 2 Announcement is made on the loudspeaker telling residents to discharge waste
- 3 During collection operations
- 4 Residents bring their waste out for discharge
- 5 Bamboo baskets with "Clean Vientiane" marking

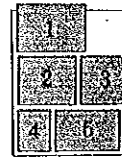
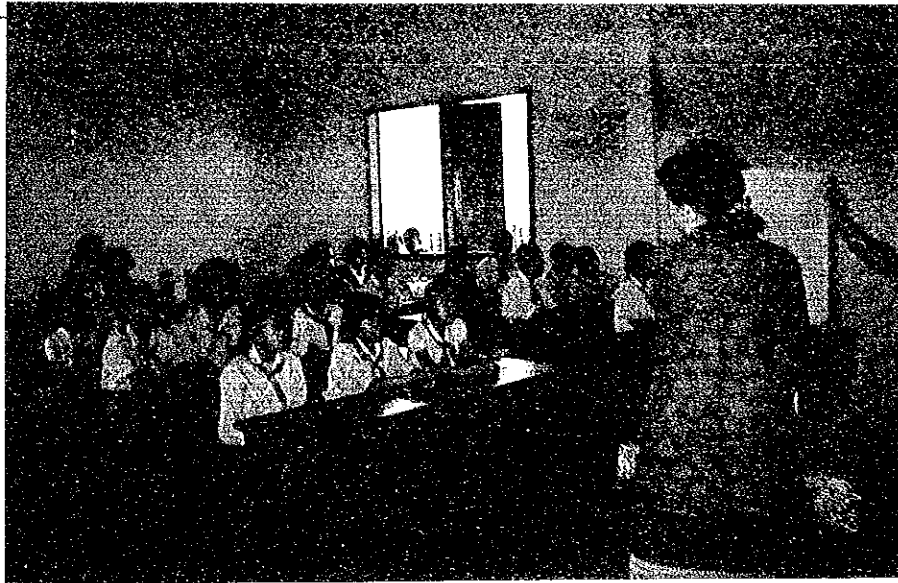


Plate 5. Collection Experiment



- 1 Disposal of waste collected in the bund at KM 18 disposal site
- 2 During Sanitary Landfill Operation
- 3 Entrance Gate of KM 18
- 4 Demonstration on weighbridge operation in the present of the Governor
- 5 Outside view of KM 18 after improvement

Plate 6. Experiment on Sanitary Landfill Operation



- 1 Explanation to pupils in primary school
- 2 Explanation conducted to members of Lao Women's Federation
- 3 Show pictures for better understanding
- 4 "Are there any questions?"
- 5 People joining in the Cleansing Day

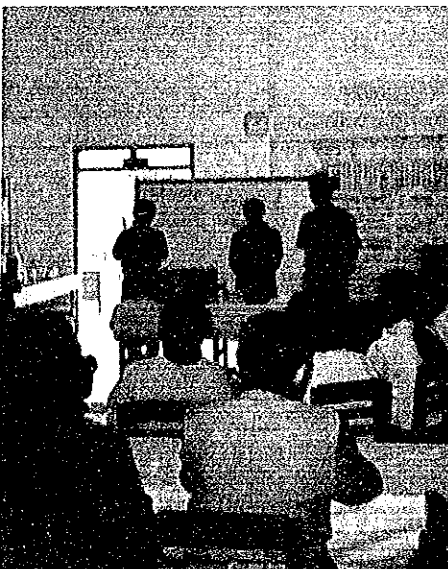
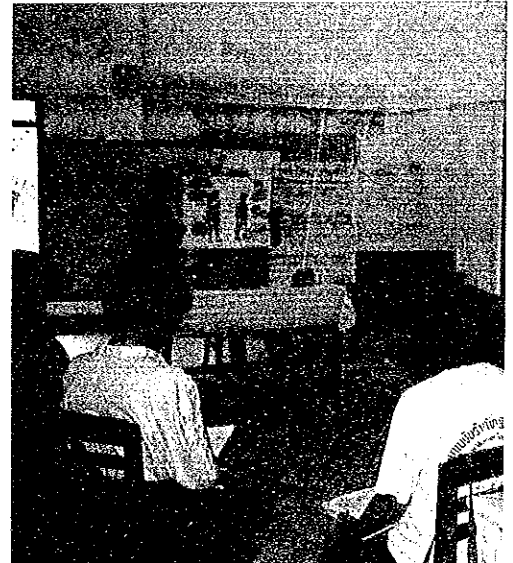


Plate 7. Public Education

THE STUDY ON THE SOLID WASTE MANAGEMENT
SYSTEM IMPROVEMENT PROJECT IN VIENTIANE

LIST OF VOLUME

PREFACE

LOCATION MAP

PLATES

Plate 1. Image of Clean Vientiane

Plate 2. Image of Improved Collection System

Plate 3. Image of Sanitary Landfill at KM 18-DS

Plate 4. Present Solid Waste Management

Plate 5. Collection Experiment

Plate 6. Experiment on Sanitary Landfill Operation

Plate 7. Public Education

CONTENTS OF MAIN REPORT

ABBREVIATIONS

LIST OF TABLES

LIST OF FIGURES

CONTENTS OF MAIN REPORT

Pages

PART I PRESENT SOLID WASTE MANAGEMENT

CHAPTER 1 INTRODUCTION

1.1	Background.....	1-1
1.2	Objective of the Study.....	1-3
1.3	Policy of the Study.....	1-3

1.4	Scope of the Study.....	1-7
1.5	Key Assumptions.....	1-7
1.6	Work Process of the Study.....	1-11
1.7	Study Organization.....	1-14
1.8	Final Report.....	1-14
1.9	Acknowledgement.....	1-15

CHAPTER 2 PROFILE OF THE STUDY AREA

2.1	Natural Conditions.....	2-1
2.2	Urban Structure.....	2-3
2.3	Social Conditions.....	2-9
2.4	Population.....	2-14
2.5	Economic Conditions.....	2-17

CHAPTER 3 FIELD SURVEY

3.1	Waste Amount and Composition Survey.....	3-1
3.2	Community Consciousness Survey.....	3-12
3.3	Investigation of Present and Candidate Disposal Sites....	3-21
3.4	Others.....	3-27

3.4.1	Survey on Private Contractors.....	3-27
3.4.2	Survey on Scavengers.....	3-32
3.4.3	Survey on Private Recyclers.....	3-36
3.4.4	Construction of an Inspection Building and Installation of a Weighbridge.....	3-40
3.4.5	Time and Motion Study.....	3-40

CHAPTER 4 PRESENT SOLID WASTE MANAGEMENT

4.1	Existing Plans and Studies.....	4-1
4.2	Waste Stream.....	4-1
4.3	Collection and Haulage.....	4-14
4.4	Road Sweeping, Drain Cleansing and Grass Cutting.....	4-24
4.5	Processing and Final Disposal.....	4-26
4.6	Recycling.....	4-30
4.7	Equipment.....	4-35
4.8	Organization.....	4-37
4.9	Financial Situation.....	4-49
4.10	Public Cooperation, Legislation and Enforcement.....	4-54

CHAPTER 5 EVALUATION OF PRESENT SOLID WASTE MANAGEMENT

5.1	Identification of Problems.....	5-1
5.2	Improvement Measure.....	5-11

PART II BASIC PLAN

CHAPTER 6 PLANNING FRAMEWORKS FOR A BASIC PLAN

6.1	Goals and Targets.....	6-1
6.2	Approach to the Attainments of Goals and Targets.....	6-6
6.3	Projection of Future Population.....	6-8
6.4	Estimation of Future Solid Waste Amount and Composition..	6-10

CHAPTER 7 SELECTION OF AN OPTIMUM ALTERNATIVE FOR TECHNICAL SYSTEM

7.1	Examination of System Components.....	7-1
7.1.1	Selection Method of an Optimum Alternatives.....	7-1
7.1.2	Discharge and Storage.....	7-5
7.1.3	Collection and Haulage.....	7-7
7.1.4	Road Sweeping, Drain Cleansing and Grass Cutting.....	7-11
7.1.5	Processing and Recycling.....	7-13
7.1.6	Final Disposal.....	7-19
7.2	Technical System Alternatives.....	7-25
7.2.1	Summary of Alternative Plans.....	7-25
7.2.2	Preliminary Design.....	7-27
7.2.3	Outline of Facility and Equipment.....	7-34
7.2.4	Cost Estimation.....	7-37
7.3	Evaluation.....	7-43
7.3.1	Methodology.....	7-43
7.3.2	Technical Evaluation.....	7-45
7.3.3	Economic and Financial Evaluation.....	7-48

7.3.4	Evaluation of Transactional Facilitation.....	7-52
7.3.5	Environmental Evaluation.....	7-55
7.3.6	Selection of an Optimum Alternative.....	7-58

CHAPTER 8 OUTLINE OF THE BASIC PLAN

8.1	Technical System.....	8-1
8.2	Institutional System.....	8-8
8.2.1	Methodology.....	8-8
8.2.2	Organization.....	8-8
8.2.3	Finance.....	8-20
8.2.4	Laws and Enforcement.....	8-27
8.2.5	Public Education.....	8-29
8.2.6	Training of SWM Personnel.....	8-31
8.3	Phased Implementation Plan.....	8-36
8.3.1	Stage Plan.....	8-36
8.3.2	Financial Plan.....	8-44
8.3.3	Selection of the First Priority Project.....	8-52

PART III FEASIBILITY STUDY

CHAPTER 9 IMPLEMENTATION OF IMMEDIATE IMPROVEMENT PLAN

9.1	Immediate Improvement Needs.....	9-1
9.1.1	Technical System.....	9-2
9.1.2	Institutional System.....	9-3
9.2	Immediate Improvement Plan.....	9-4

9.2.1	Technical System.....	9-4
9.2.2	Institutional System.....	9-12
9.3	Implementation.....	9-18
9.3.1	Technical System.....	9-18
9.3.2	Institutional System.....	9-22

CHAPTER 10 EXECUTION OF PILOT PROJECT

10.1	Purpose of Pilot Project.....	10-1
10.2	Collection Experiment.....	10-2
10.2.1	Objective.....	10-2
10.2.2	Plan.....	10-3
10.2.3	Execution.....	10-13
10.2.4	Continuation by DCTC.....	10-32
10.2.5	Findings.....	10-35
10.3	Experiment on Sanitary Landfill Operation.....	10-40

CHAPTER 11 FEASIBILITY STUDY OF THE FIRST PRIORITY PROJECT

11.1	Preliminary Design of Technical System.....	11-1
11.1.1	Design Conditions.....	11-1
11.1.2	Strategy for Expansion of Collection Area.....	
11.1.3	Collection and Haulage.....	11-4
11.1.4	Road Sweeping, Drain Cleansing and Grass Cutting.....	11-23
11.1.5	Final Disposal.....	11-27
11.1.6	Operation and Maintenance of Equipment.....	11-52
11.2	Institutional Plan.....	11-61

11.2.1	Organization.....	11-61
11.2.2	Finance.....	11-68
11.2.3	Laws and Enforcement.....	11-77
11.2.4	Public Education.....	11-76
11.3	Estimation of Project Cost.....	11-78
11.3.1	Investment Cost.....	11-78
11.3.2	Operation Cost.....	11-84
11.4	Project Evaluation.....	11-90
11.4.1	Technical Evaluation.....	11-90
11.4.2	Environmental Evaluation.....	11-92
11.4.3	Social Evaluation.....	11-97
11.4.4	Economic and Financial Evaluation.....	11-101

PART IV IMPLEMENTATION PLAN AND RECOMMENDATIONS

CHAPTER 12 IMPLEMENTATION PLAN

12.1	Operation Manual for SWM.....	12-1
12.2	Project Implementation Body and Schedule.....	12-3
12.3	Financial Plan.....	12-6
12.4	Establishment of Monitoring System.....	12-11

CHAPTER 13 RECOMMENDATIONS

13.1	Conclusion.....	13-1
13.2	Recommendations.....	13-10

APPENDICES

Appendix 1	Scope of Work.....	1
Appendix 2	Study Organization and Persons Involved.....	11

ABBREVIATION

ORGANIZATIONS

DCTC, VM	: Department of Communication, Transport and Construction, Vientiane Municipality
DPH, VM	: Department of Public Health, Vientiane Municipality
DPF, VM	: Department of Planning and Finance, Vientiane Municipality
ITSTP, MCTPC	: Institute of Technical Studies and Town Planning, Ministry of Communication, Transport, Post and Construction
JICA	: Japan International Cooperation Agency
JIS	: Japan Industrial Standard
JSCE	: Japan Society of Civil Engineers
Lao P.D.R.	: Lao People's Democratic Republic
MCTPC	: Ministry of Communication, Transport, Post and Construction
MOH	: Ministry of Health
NGD	: National Geographic Department
PRIVATE-CRC	: Construction and Renovation Company No.1
PRIVATE-ISC	: Inter-Construction and Sanitation Company
PRIVATE-SWM	: Solid Waste Management Company
SSC, MEPE	: State Statistical Center, Ministry of Economy, Planning and Finance
SSC, VM	: State Sanitary Company, Vientiane Municipality
UNDP	: United Nations Development Program
US	: United States
USAID	: United States Agency for International Development
USSR	: Union of Soviet Socialist Republics
VM	: Vientiane Municipality
WHO	: World Health Organization

REPORT & STUDY

ASG	: Apparent Specific Gravity
CCS	: Community Consciousness Survey
CV	: Calorific Value
DCDS	: Dongphosi Candidate Disposal Site
DF/R	: Draft Final Report
DRAINAGE F/S	: Feasibility Study on Improvement of Drainage System in Vientiane, March 1990
DS	: Disposal Site
F/R	: Final Report
IC/R	: Inception Report
IT/R	: Interim Report
KM 18-DS	: Kilometer 18 of Route 13 Disposal Site
M/M	: Minutes of Meetings
N.A.	: Not Available
NCDS	: Noensaard Candidate Disposal Site
PR/R	: Progress Report
S/W	: Scope or Work for the Study
SWM	: Solid Waste Management
UNDP M/P	: Master Plan for Urban Development in Vientiane conducted by UNDP (Vientiane, Schema Directeur ETD Amenagement Urbain Rapport Final Mai 1989)
WACS	: Waste Amount and Composition Survey

SOCIO-ECONOMY

EIRR	: Economic Internal Rate of Return
GDP	: Gross Domestic Product
GRDP	: Gross Regional Domestic Product
GVA	: Gross Value Added
NRMP	: Net Regional Material Products
O&M	: Operation and Maintenance

TECHNICAL

EL (el)	: Elevation
Dai.	: Diameter
GL	: Ground Level
RC	: Reinforced Concrete
BOD	: Biochemical Oxygen Demand
Cl ⁻	: Chlorine Ion
COD	: Chemical Oxygen Demand
DO	: Dissolved Oxygen
Hg	: Mercury
Pb	: Lead
T-N	: Total Nitrogen

UNIT

m m	: millimeter	cm	: centimeter
m	: meter	km	: kilometer
m ²	: square meter	ha	: hectare
m ³	: cubic meter	mg	: milligram
lit.	: litre	km ²	: square kilometer
sq	: square	cu.	: cubic
kg	: kilogram	t	: ton
s(sec)	: second	min.	: minutes
hr	: hour	d	: day
%	: percent	p.a	: per annum
o/oo	: per mille (1/1.000)	no.	: number
nos.	: numbers	k w	: kilowatt
res.	: residence	per.	: person
hou.	: household	emp.	: employees

LIST OF TABLES

		Pages
Table 2.3-1	Comparison of Mortality Rate and Life Expectancy....	2-10
Table 2.3-2	Number of Patients by Kind of Disease.....	2-11
Table 2.4-1	Present Population and Number of Families in Vientiane Municipality.....	2-16
Table 2.5-1	Proportion of GRDP and GDP (%).....	2-18
Table 2.5-2	Composition of Labour Force in Vientiane Municipality.....	2-19
Table 2.5-3	Tax and User Charge.....	2-20
Table 3.1-1	Survey Period.....	3-4
Table 3.1-2	Method of Survey.....	3-6
Table 3.1-3	Waste Amount in Residences and Shops.....	3-8
Table 3.1-4	Amount of Institutional and Road Sweeping Wastes....	3-9
Table 3.1-5	Physical Composition of Waste.....	3-10
Table 3.1-6	Three Contents, Low Calorific Value and C/N Ratio of Waste.....	3-13
Table 3.3-1	Results of the Investigation.....	3-24
Table 3.4-1	Status of Private Contractors.....	3-29
Table 3.4-2	Types and Prices of Reusable Materials Recovered....	3-34
Table 4.2-1	Modification of Hauled Waste Amount.....	4-7
Table 4.3-1	Present Discharge and Storage System.....	4-15
Table 4.3-2	Present Collection and Haulage System.....	4-18
Table 4.6-1	Present Recycling System in the Study Area.....	4-31
Table 4.8-1	Number of Staff of the Bureau and State Companies of DCTC in November 1991.....	4-42
Table 4.8-2	Balance Sheet of State Sanitary Company.....	4-50
Table 4.8-3	Solid Waste Management Cost by Work Items.....	4-51
Table 4.8-4	Cost of Collection Services by DCTC and Three Private Companies.....	4-53
Table 5.2-1	Improvement Measures.....	5-13
Table 6.4-1	Future Solid Waste Amount.....	6-11
Table 7.1-1	Scope of Examination.....	7-2
Table 7.1-2	Examination of Processing Facilities.....	7-15

Table 7.2-1	Number of Collection Vehicles (DT) Required for Domestic and Commercial Waste.....	7-28
Table 7.2-2	Conditions of Candidate Sites for Final Disposal....	7-31
Table 7.2-3	Outline of Equipment for Collection and Other Cleansing System in 2000.....	7-35
Table 7.2-4	Outline of Each Disposal Site.....	7-36
Table 7.2-5	Unit Cost of Utilities and Fuel.....	7-38
Table 7.2-6	Unit Cost of Equipment.....	7-38
Table 7.2-7	Life and Residual Value of Experiment.....	7-39
Table 7.2-8	Details of Alternatives in 2000.....	7-40
Table 7.2-9	Investment Cost.....	7-41
Table 7.2-10	Annual Expenses in 2000.....	7-42
Table 7.3-1	Technical Evaluation.....	7-47
Table 7.3-2	Economic Evaluation.....	7-49
Table 7.3-3	Financial Evaluation.....	7-51
Table 7.3-4	Combined Economic and Financial Evaluation.....	7-51
Table 7.3-5	Transactional Evaluation.....	7-54
Table 7.3-6	Environmental Evaluation.....	7-57
Table 7.3-7	Overall Evaluation.....	7-58
Table 8.1-1	Outline of Technical System in 2000.....	8-2
Table 8.1-2	Outline of Proposed Discharge and Storage System in 2000.....	8-3
Table 8.1-3	Outline of Proposed Collection and Haulage System in 2000.....	8-4
Table 8.1-4	Outline of Proposed Road Sweeping, Drain Cleansing and Grass Cutting System in 2000.....	8-5
Table 8.1-5	Outline of Final Disposal System in 2000.....	8-6
Table 8.1-6	Outline of Vehicle Depot and Maintenance Shop at KM 7.....	8-7
Table 8.2-1	Proposed Number of Personnel for the USD in 2000....	8-12
Table 8.2-2	Estimated Burden in 2000.....	8-23
Table 8.3-1	Phased Improvement Plan.....	8-37
Table 8.3-2	Investment Plan.....	8-45
Table 8.3-3	Annual Cost for Operation and Maintenance.....	8-45
Table 8.3-4	Solid Waste to be Treated by USD.....	8-45
Table 8.3-5	Financial Source for Investment.....	8-47

Table 8.3-6	Financial Source for Annual Expenses.....	8-47
Table 8.3-7	Amount of Waste According the Burdens and Fee.....	8-47
Table 8.3-8	Tariff Table.....	8-48
Table 8.3-9	Budget of Vientiane Municipality for Solid Waste....	8-48
Table 8.3-10	Balance Sheet and Cash Flow of SWM in Vientiane.....	8-50
Table 8.3-11	Outline of Proposed Technical System in 1995.....	8-53
Table 9.2-1	Accounting Sheet.....	9-14
Table 9.2-2	Ledger for Management of Collection Fee.....	9-15
Table 9.3-1	Cost Analysis Sheet.....	9-25
Table 10.2-1	Area Condition.....	10-7
Table 10.2-2	Number of Families Wishing to enter into a Contract and the Participation Ratio.....	10-16
Table 10.2-3	Basic Data for the Collection Experiment Plan.....	10-17
Table 10.2-4	Comparison of Collection Efficiency.....	10-27
Table 10.2-5	Number of Families and Shops Contracted.....	10-32
Table 10.2-6	Balance of Revenue and Expenditure.....	10-33
Table 10.2-7	Revenue and Expenditure of Collection Experiment....	10-36
Table 11.1-1	Population Density and Ratio of Participation in the Candidate Bans.....	11-5
Table 11.1-2	Outline of Proposed Discharge System in 1995.....	11-11
Table 11.1-3	Outline of Proposed Collection and Haulage System in 1995.....	11-12
Table 11.1-4	Extension of Service Coverage.....	11-13
Table 11.1-5	Amount of Domestic and Commercial Waste Collected by Each Sector.....	11-15
Table 11.1-6	Operation Plan for Collection Vehicle (CDT).....	11-17
Table 11.1-7	Operation Plan for Collection Vehicle (DCT).....	11-21
Table 11.1-8	Number of Containers Required.....	11-22
Table 11.1-9	Outline of Proposed Road Sweeping, Drain Cleansing and Grass Cutting System in 1995.....	11-24
Table 11.1-10	Designed Landfill Volume.....	11-29
Table 11.1-11	Characteristics of Clayey Soil.....	11-30
Table 11.1-12	Designed Discharge.....	11-37
Table 11.1-13	Function of Maintenance Shop.....	11-56
Table 11.2-1	Proposed Number of Personnel According to Section (1995).....	11-63

Table 11.2-2	Estimated Burden in 1997.....	11-71
Table 11.2-3	Necessary Share to Cover the Cost.....	11-72
Table 11.2-4	Tariff for SWM.....	11-72
Table 11.3-1	Investment Cost for Collection and Haulage.....	11-79
Table 11.3-2	Investment Cost for Cleansing.....	11-79
Table 11.3-3	Investment for Disposal Site.....	11-80
Table 11.3-4	Investment Cost for Maintenance Shop.....	11-81
Table 11.3-5	Investment Cost for Fee Collection.....	11-82
Table 11.3-6	Total Investment Cost.....	11-83
Table 11.3-7	Number of Personnel for the USD.....	11-85
Table 11.3-8	Annual Operation Cost of Collection and Haulage.....	11-86
Table 11.3-9	Annual Operation Cost of Clearing.....	11-86
Table 11.3-10	Operation Cost of Disposal Site.....	11-87
Table 11.3-11	Operation Cost of Maintenance Shop.....	11-88
Table 11.3-12	Administrative Cost.....	11-89
Table 11.3-13	Total Operation Cost in 1995.....	11-89
Table 11.4-1	Mortality of Lao P.D.R. Compare to Neighboring Countries.....	11-97
Table 11.4-2	Comparison of Transportation Cost of Institutional Waste.....	11-105
Table 11.4-3	Comparison of with Maintenance Shop and Without Maintenance Shop.....	11-109
Table 11.4-4	Balance of Collection Service.....	11-111
Table 11.4-5	Balance of Collection Service Considering Burden for Other Operation.....	11-112
Table 11.4-6	Number of Vehicle by Type.....	11-113
Table 11.4-7	Revenue from Tipping Fee.....	11-113
Table 11.4-8	Balance of Final Disposal Service.....	11-114
Table 11.4-9	Investment Plan for SWM of VM.....	11-116
Table 11.4-10	Annual Cost Estimated.....	11-117
Table 11.4-11	Calculation of Balance, Debt and Depreciation.....	11-118
Table 11.4-12	The Budget Allocation to SWM in VM Budget (Foreign Loan).....	11-119
Table 12.3-1	Financial Resources for Investment.....	12-7
Table 12.3-2	Comparison of Revenue.....	12-8
Table 12.3-3	Allocation of VM Budget for SWM.....	12-9

Table 12.3-4	Balance Sheet and Cash Flow.....	12-10
Table 12.4-1	Personnel to be Involved in Monitoring Operations...	12-11
Table 12.4-2	Principal and Supporting Indicators.....	12-12
Table 13.1-1	Waste Stream in Vientiane Urban Area in January 1992.....	13-1
Table 13.1-2	Comparison of SWM Budget Share in Local Government Budget.....	13-3

LIST OF FIGURES

	Pages
Fig. 2.1-1 Study Area.....	2-2
Fig. 2.2-1 Administration Map of Vientiane Municipality.....	2-4
Fig. 3.3-1 Location of Present and Candidate Disposal Sites....	3-22
Fig. 3.4-1 Location of DCTC and Private Contractor	
Fig. 3.4-2 Distribution Channel of Reusable Materials in the Study Area.....	3-37
Fig. 4.2-1 Concept of Waste Stream.....	4-3
Fig. 4.2-2 Generation and Discharge of Domestic Waste in the Collection Area.....	4-4
Fig. 4.2-3 Generation and Discharge of Commercial Waste in the Collection Area.....	4-6
Fig. 4.2-4 Present Waste Stream in the Study Area.....	4-10
Fig. 4.3-1 Collection Routes of DCTC and Private Contractors...	4-19
Fig. 4.8-1 Duties of Environmental Health and Sanitation Section, NIHE, MOH.....	4-40
Fig. 4.8-2 Organization Chart of Cleansing Section.....	4-44
Fig. 6.4-1 Future Waste Stream in the Study Area (2000).....	6-12
Fig. 7.1-1 Perspective Illustration of Sanitary Landfill Development and Operation in Level 2, 3 and 4.....	7-22
Fig. 7.2-1 Summary of Alternative Plan.....	7-26
Fig. 7.2-2 Site Development Plans for Three Candidate Disposal Sites.....	7-33
Fig. 7.3-1 Procedure for Evaluating Alternatives.....	7-44
Fig. 8.2-1 Proposed Organization of the USD.....	8-14
Fig. 8.2-2 Principle of Solid Waste Services and Fees.....	8-25
Fig. 8.3-1 Stage Plan of Final Disposal.....	8-42
Fig. 8.3-2 Staged Development Plan for KM 18-DS.....	8-43
Fig. 8.3-3 Cash Flow of Basic Plan.....	8-51
Fig. 9.2-1 Amount of Waste Hauled to KM 18-DS January, 1992....	9-6
Fig. 9.2-2 Collection Routes for Cleaning-up Roads, Drains and Public Areas (Ban Sisavath Tay).....	9-8
Fig. 9.3-1 Symbol of "Clean Vientiane Project" used as Sticker and Uniform for Collection Experiment.....	9-26

Fig. 9.3-2	One of the Drawing Boards prepared by the Study Team for Education Program.....	9-28
Fig. 9.3-3	The Drawing Board prepared by the Study Team for Education Program.....	9-29
Fig. 9.3-4	The Drawing Board prepared by the Study Team for Education Program.....	9-30
Fig. 9.3-5	The Drawing Board prepared by the Study Team for Education Program.....	9-31
Fig. 9.3-6	The Drawing Board prepared by the Study Team for Education Program.....	9-32
Fig. 9.3-7	The Drawing Board prepared by the Study Team for Education Program.....	9-33
Fig. 9.3-8	The Drawing Board prepared by the Study Team for Education Program.....	9-34
Fig. 9.3-9	The Drawing Board prepared by the Study Team for Education Program.....	9-35
Fig. 10.2-1	Outline of Experiment.....	10-4
Fig. 10.2-2	Candidate Sites for Collection Experiment	10-6
Fig. 10.2-3	Organization Chart of Executing Committee for Collection Experiment.....	10-12
Fig. 10.2-4	Location Map of Contract Service Recipients.....	10-18
Fig. 10.2-5	Collection Routes and Points of Ban Dong Mieng.....	10-19
Fig. 10.2-6	Collection Routes for Cleaning-up of Road, Drain and Public Areas in Ban Dong Mieng.....	10-20
Fig. 10.2-7	Time for Collection Service Works.....	10-22
Fig. 10.2-8	Comparison of Working Time for One Trip.....	10-24
Fig. 10.2-9	Comparison of Transportation Distance for One Trip..	10-24
Fig. 10.3-1	Site Development for the Experiment on Sanitary Landfill.....	10-42
Fig. 11.1-1	Future Waste Stream in the Study Area (1995).....	11-3
Fig. 11.1-2	Strategic Map for Expansion of Collection Area.....	11-7
Fig. 11.1-3	Proposed Containers Location Map for Large Waste Producers and Roads.....	11-19
Fig. 11.1-4	Geological Profile of KM 18-DS.....	11-31
Fig. 11.1-5	Layout of Main Facilities.....	11-34
Fig. 11.1-6	Typical Cross Section of Enclosing Bund.....	11-35
Fig. 11.1-7	Typical Cross Section of Divider.....	11-36

Fig. 11.1-8	Proposed Drainage System at KM 18-DS.....	11-38
Fig. 11.1-9	Typical Cross Sections of Access.....	11-40
Fig. 11.1-10	Cover by Cell Method.....	11-45
Fig. 11.1-11	Site Development and Layout of Maintenance Shop.....	11-53
Fig. 11.1-12	Plan of Buildings for Maintenance Shop.....	11-55
Fig. 11.2-1	Proposed Organization of the USD.....	11-62
Fig. 11.2-2	Organization Scheme of USD.....	11-65
Fig. 11.4-1	Number of Patients by Kind of Diseases.....	11-99
Fig. 11.4-2	Cash Flow of Project in Case of Loan.....	11-121
Fig. 11.4-3	Cash Flow of Project in Case of Grant Aid.....	11-121
Fig. 11.4-4	Sensitivity Analysis Case 1.....	11-123
Fig. 11.4-5	Sensitivity Analysis Case 2.....	11-123
Fig. 11.4-6	Sensitivity Analysis Case 3.....	11-124
Fig. 11.4-7	Sensitivity Analysis Case 4.....	11-124
Fig. 11.4-8	Sensitivity Analysis Case 5.....	11-126
Fig. 11.4-9	Sensitivity Analysis Case 6.....	11-126
Fig. 11.4-10	Sensitivity Analysis Case 7.....	11-128
Fig. 11.4-11	Sensitivity Analysis Case 8.....	11-128
Fig. 11.4-12	Sensitivity Analysis Case 9.....	11-130
Fig. 11.4-13	Sensitivity Analysis Case 10.....	11-130
Fig. 12.1-1	Outline of Operation for SWM.....	12-2
Fig. 12.2-1	Implementation Schedule.....	12-5