社会開発調査部報告書

No. 22

Japan International Cooperation Agency (JICA)
Ministry of Environment of the Government of Morocco

The Study on the National Guidelines for Solid Waste Management for the Kingdom of Morocco

Final Report

Book 3

National Action Programs for Solid Waste Management

August 1997

EX Corporation
&
Yachiyo Engineering Co., Ltd.

Japan International Cooperation Agency (JICA)
Ministry of Environment of the Government of Morocco

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PREFACE

In response to the request from the Government of the Kingdom of Morocco, the Government of Japan decided to conduct the Study on the National Guideline for Solid Waste Management for the Kingdom of Morocco and entrusted the study to the Japan International Cooperation Agency (JICA).

JICA has sent to Morocco a study team headed by Mr. Masato Ohno, Director of Environmental Department, EX Corporation., Ltd., three times between January 1996 to May 1997.

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

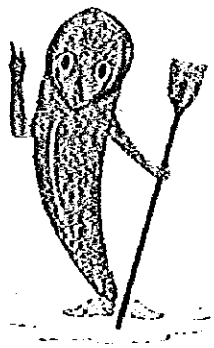
I hope that this report will contribute to the promotion of the project and to the enhancement of friendly relations between our two countries.

I wish to express my sincere appreciation to the officials concerned of the Government of the Kingdom of Morocco for their close cooperation extended to the team.

August 1997

Kimio Fujita
President
Japan International Cooperation Agency

أنا أساهم في نظافة مدينتي ....! وأنت ؟

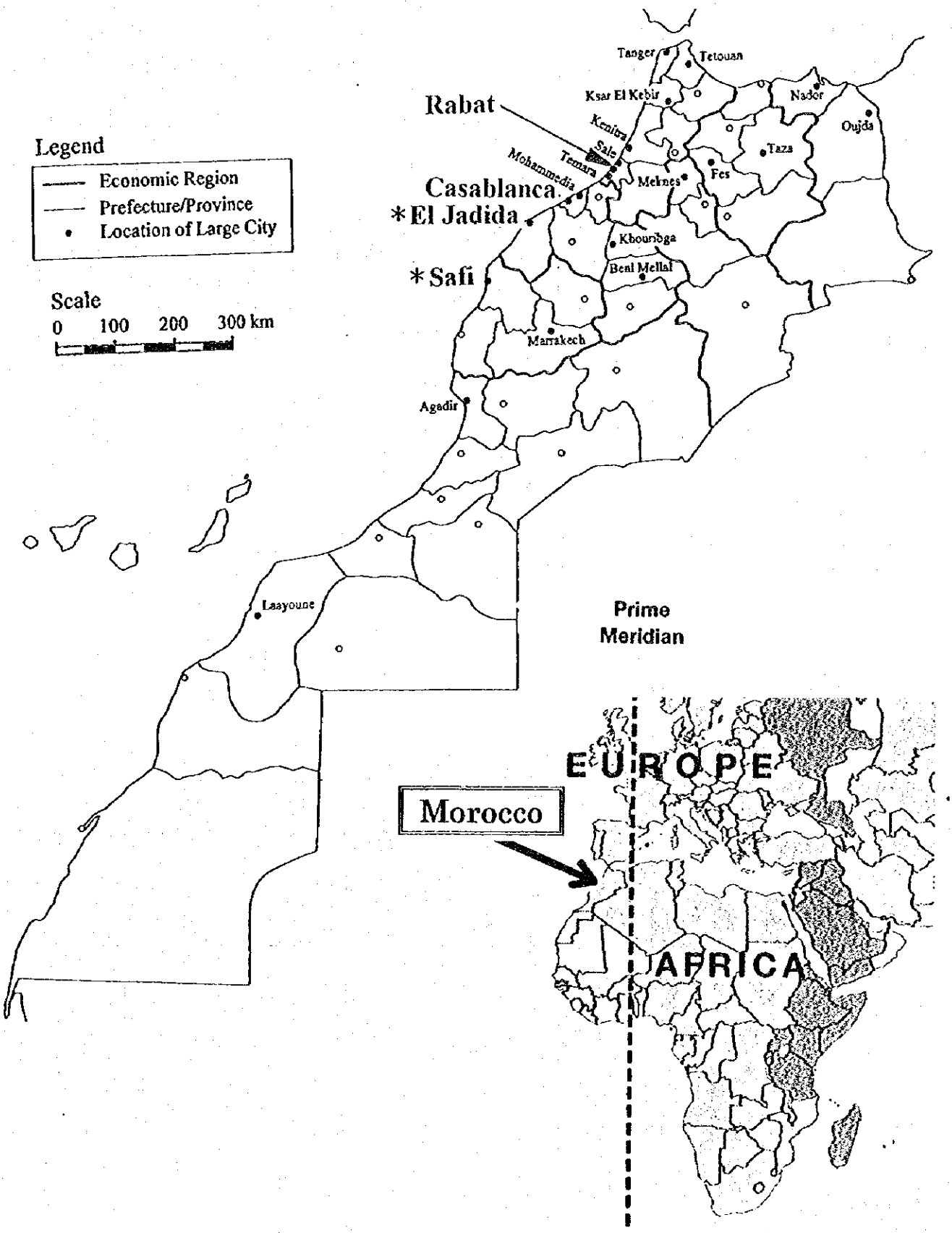


وزارة الداخلية -- وزارة البيئة

الوكالة اليابانية للتعاون الدولي

مدينة آسفي

Location Map of Morocco



* Safi and El Jadida were selected for the second year study of this project.

Exchange Rate (as of July 1997)

1 Dirham = 0.115 US dollars = 13 yen

Abbreviation List

BMH	Municipal Health Service
CNE	National Council for Environment (Conseil National de l'Environement)
CRE	Regional Council for Environment (Conseil Régional de l'Environement)
DAHIR	Law, Decree, or other legal document signed by the King
DH	Dirham
EU	European Union, E.E.C
FEC	Fond D'Equipement Communal Communal Fund for Equipment
GDLC	General Department of the Local Government, MoI
HCS	Haul Container System
MoA	Ministry of Agriculture
MoC&I	Ministry of Commerce and Industry
MoE	Ministry of Environment
MoEM	Ministry of Energy and Mines
MoH	Ministry of Health
MoI	Ministry of Interior
MoPW	Ministry of Public Works
NP	National Promotion
ONEP	National Office for Drinking Water
SWM	Solid Waste Management
USE	Under Secretariat for Environment, MoI
Veh.	Vehicle

Final Report
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Book 3

THE STUDY ON THE NATIONAL GUIDELINES FOR SOLID WASTE MANAGEMENT FOR THE KINGDOM OF MOROCCO

INTRODUCTION

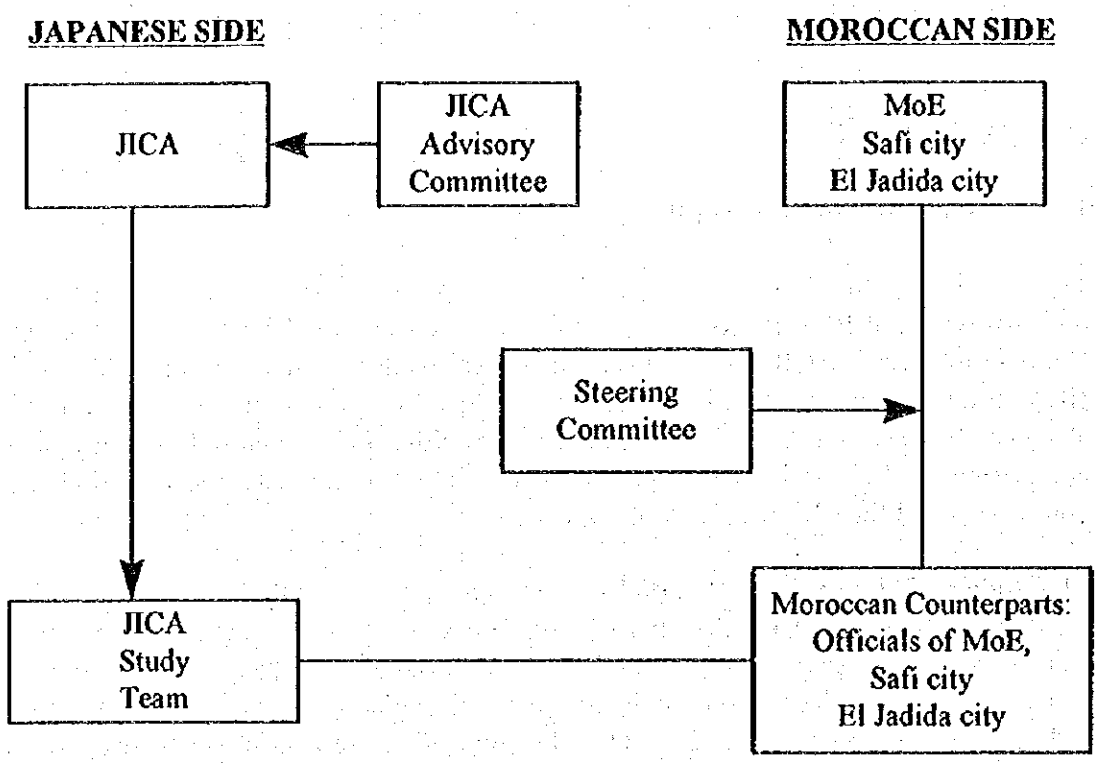
1. Objectives of the Study

The objective of the Study is to strengthen the capacity of solid waste management at both national and local levels. This study has been executed by Japan International Cooperation Agency (JICA) based on the request from the Government of Morocco. JICA commissioned the study to a joint venture comprising EX Corporation and Yachiyo Engineering Co., Ltd. The joint venture has organized a study team comprising of 11 specialists. The Study has been conducted jointly by Japanese consultants and their Moroccan counterparts.

The study period was about 18 months from January 1996 to July 1997. The Study is divided into two phases, the first phase being from the beginning up to September 1996, and the second phase being from October 1996 till the end. The objective of the first phase study is to formulate the guidelines and action plan for solid waste management at both national and local levels. The objective of the second phase is to apply the guidelines formulated and check their applicability. Two cities, i.e. Safi and El Jadida were selected for the second phase. The Study team in collaboration with the counterparts in Safi city have formulated a plan for improvement of solid waste management. In addition, we have implemented a public education campaign (demonstration project) aiming at strengthening citizens' understanding and cooperation concerning city cleansing. We have also formulated a plan for improvement of disposal of solid waste for El Jadida. It is expected that the plans will serve as a model for other local authorities in Morocco.

2. Study Organization

The study organization is shown in the figure below. This study has been conducted jointly by the Study Team led by Mr. Ohno and the Moroccan counterparts, i.e. officials of Ministry of Environment, Safi city and El Jadida city. A key counterpart agency on the Moroccan side is the Ministry of Environment. For the smooth execution of the study, the Moroccan side formed a steering committee comprising of representatives of the Ministry of Environment, Ministry of Interior, Ministry of Health, Ministry of Public Works, and Ministry of Commerce and Industry. Mrs. Layachi, Director, Department of Observation, Study and Coordination, Ministry of Environment served as chairman of the steering committee. On the Japanese side, an advisory committee was formed for the study. Dr. Masaru Tanaka, Director, Department of Waste Management Engineering, the National Institute of Health, served as chairman of the Advisory Committee.



MoE: Ministry of Environment

3. Reports

This study has produced the following reports:

1. Inception report
2. Progress report (1)
3. Interim report
4. Progress report (2)
5. Draft final report
6. Final report

The final report consists of the following books:

Book 1 Guidelines for National Level Policies and Actions for Solid Waste Management
- Part 1 National Strategy
- Part 2 Laws, Institutions, and Finance
- Part 3 Industrial and Hazardous Waste
- Part 4 Infectious Waste

Book 2 Guidelines for Improvement of Solid Waste Management for Urban Communes and Communities
- Part 1 Management and Institutions
- Part 2 Technical Guidelines

Book 3 National Action Programs for Solid Waste Management

Book 4 Solid Waste Management Plans for Safi and El Jadida
- Part 1 Solid Waste Management Plan for Safi
- Part 2 Waste Disposal Plan for El Jadida

Book 5 Summary

Book 6 Supporting Report :
Current Conditions of Solid Waste Management in Morocco

Book 7 Data Book:
Appendices to Solid Waste Management Plan for Safi

Book 8 Japanese Summary

All the Book except for Book 8 has been prepared in English and French.

4 General Information on this Book

The Ministry of Environment and the JICA Study Team have conducted joint research to prepare SWM policies at the national level including administrative guidelines, and guidelines for improvement of SWM at the local government level. The national strategy for SWM in Book 1-Part 2 defined the role of the national government and then introduced national policies and actions for development of municipal SWM and improvement of proper municipal waste treatment. The framework and content of the actions that the government should take are presented in Book 1.

The next step to be taken is to implement the policies and ideas presented in the reports. Since they are to involve long-term strategy, there are many tasks to be carried out. It is unrealistic to try to implement them in a short period taking into consideration the country's limited resources and its other priorities. Actions, therefore, should be made according to phased plans. This report proposes a five-year national action program from 1997 to 2001.

This report was prepared for discussion by the parties involved. Proposals in this report should be discussed by MoE officials as well as among concerned authorities. It is recommended that the National Committee for Environment should support the proposals.

Action programs are addressed in the following four chapters.

Chapter 1 addresses the objectives of preparing action programs. Chapter 2 sets out the objectives of action programs. As the main chapter of this report, Chapter 3 presents the overall action programs. Chapter 4 refers to related actions and management of the action programs.

CHAPTER 1 OBJECTIVES OF PREPARING ACTION PROGRAMS

There should be more discussion of means to address solid waste issues in Morocco, and efforts to actually implement problem-solving ideas must be initiated. Ideas are no use if they are not put into effect. It is, however, difficult to prioritize such efforts since there are so many tasks to deal with. As a matter of fact, it is impossible to start handling the tasks all at the same time. Since the government must achieve a consensus among concerned officials as well as citizens, and in view of resource limitations, actions should be made according to plans according to a long term strategy.

The coming five years from 1997 to 2001 are very important years to create a base for SWM in Morocco. The future of Morocco's SWM may be determined by action programs and their implementation in the coming five years.

CHAPTER 2 OBJECTIVES OF ACTION PROGRAMS

2.1 Principles for Preparing Action Programs

There are four principles for preparing action programs.

The first principle is that action programs should support public welfare and sustainable development.

The second principle is that actions based on the programs should remove obstacles to the success of future measures.

The third principle is that action programs should be practical.

The fourth principle is that action programs should provide SWM workers with adequate motivation.

2.2 Goals

All persons in Morocco have the right to enjoy sanitary and healthy living, but they also have an obligation to support conservation measures in Morocco and behave in a safe and sanitary manner.

Goals for SWM should be established as follows based on the above rights and obligations.

1. All persons should be able to enjoy sanitary and healthy living.
2. All persons should prevent environmental pollution.
3. Essential environmental assets should be conserved for future generations.
4. The national economy should achieve sustainable development.
5. A beautiful environment that attracts foreign tourists should be maintained.

Business opportunities should be expanded, and employment and national income should be increased.

2.3 General Objectives

Formulation of a sound base for SWM is scheduled over the next five years. This base is comprised of the establishment of legal and administrative systems, human resource development, and demonstration activities. Details are as follows.

1. Establishing a legal and administrative system for SWM
2. Establishing a body of leading experts who will develop the guiding principles and practice for SWM
3. Producing pilot cases that will facilitate further development

2.4 Targets

The following targets should be achieved by 2001.

1) Actions for Establishing Legal, Institutional, and Administrative Systems

One of the highest priorities is attached to development of a legal framework. This should be achieved before any of the other targets. An administrative system should be developed as human resources are developed.

1. Specific targets are to draft laws and disposal standards, to set up a section for implementation, and to prepare the way for future administrative systems and procedures.
2. About five to ten leading experts should be developed in the field of SWM.

2) Improvement of SWM by Local Governments

Within five years, some pilot projects involving SWM improvement should be carried out and analyzed, and also human resources should be developed. Projects should be developed, placing more importance on results than on actual numbers so that lessons for future actions can be learned. Specific targets are as follows:

1. Developing at least 50 leading experts in municipal SWM
2. Preparing and implementing improvement actions for 20 to 30 municipalities
3. Constructing 3 to 5 controlled disposal sites
4. Promoting several successful cases in which SWM is contracted out to private contractors
5. Restoring existing disposal sites

3) Proper Management of Industrial and Hazardous Wastes

First of all, SWM by enterprises in Morocco should be improved by developing leading enterprises that have international SWM experience. Special waste should be defined, and treatment facilities developed for properly stabilizing it. Specific measures should be:

1. Encouraging 20 to 30 business establishments to conduct proper management of industrial and hazardous waste.
2. Developing leading private establishments in management of industrial and hazardous waste
3. Promoting several successful cases of private SWM service providers
4. Facilitating development of treatment facilities for special waste

4) Proper Infectious Waste Management

In the same way as mentioned in 3), a leading medical institution should be developed in the SWM field to disseminate proper medical waste management nationwide. Infectious waste treatment facilities should be introduced as a matter of urgency. Specific actions should be:

1. encouraging 20 to 30 medical institutions to conduct proper management of infectious waste
2. Promoting several investments in treatment facilities

5) Improving Public Awareness

Frequent opportunities should be taken to provide information and environmental education and to continuously launch campaigns so that public awareness on solid waste and environmental issues can be strengthened. The specific target is as follows.

- Increasing public awareness for waste and environmental issues

CHAPTER 3 ACTION PROGRAMS

3.1 Establishing an Administrative Framework

Laws and their enforcement system are required to secure proper SWM in Morocco. In order to enforce laws, it is necessary to establish criteria for proper disposal of waste. Therefore, action programs for these tasks include the following.

1. Immediate enactment of laws concerning solid waste
2. Establishing disposal standards
3. Strengthening administrative institutions at the national level

3.1.1 Enactment of Laws Concerning Solid Waste

The legal system should ideally be in place before implementing action programs; however, in the present case, formulation of the legal system is scheduled for the beginning of the action program.

1) Objectives

Laws to improve SWM, which is currently left unregulated, should be immediately drafted and sent to the parliament.

2) Programs

The government should prepare draft laws by 1998 in cooperation with concerned ministries and agencies, lawyers, and SWM professionals, and introduce them in parliament sessions, with the objective of having them enacted by the year 2000. In parallel with preparation of laws, regulations and orders necessary to execute the legislation should be prepared.

3) Institutions for Implementation

The government should place specialized legal staff in MoE. A working committee for law preparation should be set up, consisting of concerned ministries and agencies and academicians. The secretariat for the committee should be located in the MoE to gather information on SWM legislation in Europe and prepare draft legislation.

3.1.2 Establishment of Disposal Standards

1) Objectives

Along with preparation of legislation , disposal standards, which are indispensable for law enforcement, should be developed. The standards should be issued, after undergoing governmental discussion, as governmental orders at the same time as the law is issued. Until then, the standards should be issued as disposal criteria under a governmental circular note as an administrative instruction.

2) Programs

The following programs should be implemented.

a. Preparation of disposal standards
b. Preparation of technical standards for disposal facilities

Table 3.1-1 Action Programs for Establishing Criteria for Waste Disposal

	1997	1998	1999	2000	2001
a. Preparation and Enactment of Law	↔				
b. Preparation of Standard Criteria for Disposal					
Preparation of Standard Criteria for Special Waste	↔	↔			
Tentative Standards for Landfilling	↔	↔			
Circulation of and Instructions Regarding Disposal Criteria			↔	↔	↔
Conversion of Criteria to Standards					↔
c. Preparation of Facility Standards					
Technical Criteria for Disposal Facilities	↔	↔			
Technical Criteria for Special Waste Treatment Facilities		↔			
Technical Criteria for Infectious Waste Treatment Facilities	↔	↔			
Circulation of and Instructions on Criteria			↔	↔	↔
Conversion of Criteria to Standards			↔	↔	↔

Discussion should be started on criteria for waste disposal and standards for landfilling, which define the acceptable final waste in landfilling sites. At the same time, discussion should proceed on technical standards for disposal facilities and intermediate treatment facilities.

These standards can be prepared by 1998 without legal power, and the government should immediately start instructions based on them.

3) Institutions for Implementation

The Ministry of Environment should contain staff specialized in examining the standards. It should also establish two working committees in MoE; one for establishing criteria and technical standards for disposal facilities and the other for technical standards for intermediate treatment facilities for special waste. The government should require concerned ministries and agencies to cooperate with the committees.

3.1.3 Strengthening Administrative Institutions at the National Level

1) Objectives

Institutions should be established for administration of SWM at the national level.

2) Programs

The following actions should be taken at an early stage of action programs.

a. Coordination among ministries and agencies regarding the sharing of roles
b. Strengthening of National Waste Committee
c. Establishment of a section in MoE for environmental pollution control

In November, 1996, a small committee located under the National Environment Committee was upgraded to be the National Waste Committee. This committee should be strengthened to deal with various issues relating to solid waste.

Based on the national decentralization policy, the possibility of establishing regional offices of the MoE section for environmental pollution control should be considered.

3.2 Development of Municipal Waste Management

To provide a municipal waste collection service of better quality and to develop controlled disposal sites, the government should undertake the following actions.

1. Improving management abilities of local governments in SWM
2. Introducing weigh-bridges and waste quantity control
3. Implementing pilot projects for controlled disposal sites
4. Promoting improvement of existing disposal sites
5. Promoting privatization of SWM service

3.2.1 Improvement of Management Abilities of Local Governments in SWM

1) Objectives

The quality of SWM and productivity of its operation can be improved without increasing costs by improving management abilities of local governments in SWM. Management abilities can be strengthened by introducing management technology that

private companies are currently employing.

2) Programs

The following programs should be implemented.

a. Holding seminars for top managers
b. Providing training for municipal engineers
c. Instructions for preparing improvement plans, and their implementation

Table 3.2-1 Action Programs for Improving Management Abilities in SWM

	1997	1998	1999	2000	2001
a. Seminar for Top Managers					
Preparation	↔				
Implementation	•	•	•	•	•
b. Training					
Preparation	↔				
Implementation		•	•	•	•
Follow-up Seminar				← - - - - →	
c. Improvement Plans					
Orientation		←	—	—	→
Implementation				↔	

a. Holding Seminars for Top Managers

(1) Target Participants

Participants in seminars for top managers should be presidents, vice presidents, and secretaries-general of local governments. Seminars should be held for all communes by 2001.

(2) Frequency of Seminars

Seminars for top managers should be held twice a year; nine times by 2001.

(3) Seminar Description

The seminar should be for one day, and subjects to be taught should be SWM basics in

morning sessions and case studies in afternoon sessions.

b. Providing Training for Municipal Engineers

(1) Target Participants

Participants in training for municipal engineers will be mainly municipal engineers and chiefs of cleansing sections.

It is proposed that 100 % of municipal engineers should receive training by 2001.

(2) Frequency of Seminars

Training courses should be held once a year; four times by 2001. It will take 10 days to finish the course.

(3) Preparation of Training Texts, and Contents

Training should consist of basic management theory, case studies, practice study, and mock presentations. Six trainers for environment, institutions, management, waste quality and quantity, collection, and disposal will be required. Trainers are responsible for preparing textbooks for the subjects. Practice study includes planning for management and collection. In mock presentation, trainees will make presentation on practice studies.

(4) Follow-up Seminars

Trainers should remain in contact with their trainees. They will be able to gather information on knowledge actually used and outcomes produced after training. Successful outcomes should be explained in succeeding training courses. Experience obtained from the outcomes should be added in training courses

c. Preparation of SWM Improvement Plans by Local Governments

To create model cases, 20 to 30 high priority Urban Communes can be selected, taking into consideration seriousness of waste issues, population, and efforts made for SWM improvement. The government should instruct the selected Urban Communes to prepare SWM improvement plans based on the guidelines for local governments created jointly by the MoE and JICA Study Team. The government should also prepare instructions on implementation of the plans.

Also the government should instruct communes to implement the prepared improvement plans, and awards can be given in cases where excellent improvement is achieved.

3) Institutions for Implementation

The Ministry of Interior should take the initiative in implementing seminars, training courses, and instructions on preparing improvement plans in cooperation with the

Ministry of Environment.

The Ministry of Environment should give assistance to local governments to introduce weigh bridges.

3.2.2 Introducing Weigh Bridges and Waste Quantity Control

1) Objectives

To evaluate efficiency of Morocco's municipal SWM and to decide how to improve the existing situation, accurate data on waste quantity are necessary. The government should provide instructions on the introduction of truck scales at disposal sites that will help obtain the data.

2) Programs

The following programs can be implemented.

Table 3.2-2 Action Programs for Introducing Truck Scales

	1997	1998	1999	2000	2001
Introduction of Truck Scale as Pilot Case	←	—	→		
Nationwide Introduction of Truck Scale				←	→

a. Selection of Local Governments for Pilot Implementation

In order to introduce waste quantity control, which will improve SWM management, five to ten local governments among Urban Communities or advanced Communes should be selected for pilot implementation.

b. Assisting Introduction of Weigh-bridges, and Instructions on Waste Quantity Control

The government should assist introduction of weigh bridges and give local government instructions on waste quality control.

c. Evaluation of Introduction of Weigh-bridges, and Presentation

Results of using weigh-bridges should be explained in a presentation, and the government should offer opportunities to share and exchange the data obtained. The results should be included in top manager seminars and training courses.

3.2.3 Implementation of Pilot Projects for Controlled Disposal Sites

1) Objectives

Pilot controlled disposal sites should be constructed as model sites. Objectives of pilot projects are to create technical guidelines for construction and operation of the facilities based on experience earned and to instruct local governments in construction of the sites.

2) Programs

The following programs should be implemented.

a. Construction of three to five model controlled disposal sites
b. Preparation of technical guidelines for construction and operation of controlled disposal sites
c. Establishment of controlled disposal sites by other local governments

Table 3.2-3 Pilot Projects for Controlled Disposal Sites

	1997	1998	1999	2000	2001
a. Construction of Model Sites					
Study	↔	↔			
Construction		↔	↔		
Operation of Model Sites				↔	
b. Preparation of Technical Guidelines		↔	↔		
c. Instructions to Local Governments				↔	↔

The government should select locations for pilot project controlled disposal sites by 1997, conduct research, and complete construction by 1999.

The government should use experience with preparation of spec documents and cost estimation to create "Guidelines for Construction and Operation of Controlled Disposal Sites." The guidelines would be for local government use.

Several selected local governments should complete site construction based on the guidelines by 2001.

3) Institutions for Implementation

In order to promote pilot projects, MoE should assign promotional staff and set up a steering committee for pilot projects in cooperation with MoIF and MoPW.

3.2.4 Instructions for Improving Existing Disposal Sites

1) Objectives

After evaluating existing municipal industrial disposal sites, Those which have the most serious adverse environmental impacts on surrounding areas should be improved first.

2) Programs

The following programs can be implemented.

a. Implementation of evaluation studies of existing disposal sites
b. Instructions for preparation of improvement plans
c. Instructions for implementation of improvement projects

Table 3.2-4 Programs for Improving Existing Disposal Sites

	1997	1998	1999	2000	2001
a. Implementation of evaluation study of existing disposal sites	←	—	→		
b. Instructions for preparation of improvement plans		←	—	→	
c. Instructions for implementation of improvement Projects			←	—	→

It will be helpful in evaluating existing conditions to study existing conditions of municipal disposal sites nationwide and to conduct field observations at disposal sites used by large cities, or where major problems have emerged. Based on this evaluation, disposal sites that have a negative impact on the surrounding environment and require urgent improvement can be selected for action. Local governments supervising these disposal sites should receive advice on the preparation of improvement plans. The government should offer technical advice to the local governments when they prepare improvement plans.

The government should instruct local governments to secure funds to implement the plans and should also take necessary measures to assist in their implementation.

3) Implementation Arrangements

The government should assign experts on SWM disposal in the MoE to promote action programs.

3.2.5 Promotion of Privatization

1) Objectives

Privatization is an effective way to improve local government SWM. Its effectiveness needs to be studied and guidelines for privatization should be created to facilitate consideration of this matter by local governments

2) Programs

The following programs should be implemented.

a. Research on effectiveness of privatizing SWM
b. Preparation of guidelines for privatization, and dissemination to local governments

Table 3.2-5 Programs for Promoting Privatization

	1997	1998	1999	2000	2001
a. Study	↔	↔			
b. Preparation and Dissemination of Guidelines					
Preparation		↔	↔		
Instructions on Dissemination			↔	↔	↔
Seminar		•	•	•	

Prior cases of privatization in Morocco should be studied. The government should select local governments that intend to privatize SWM service and conduct research on the effectiveness of privatization.

Based on the research results, the government should prepare guidelines for privatization by 1998. They should include methods for evaluating private contractors, privatizing current human resources and assets, contracting, and monitoring.

Seminars should be held based on the guidelines by 2000. The government should give local government instructions on methods of privatization.

3) Institutions for Implementation

A working team should be set up consisting mainly of MoIF in cooperation with MoE to conduct research on and prepare guidelines for privatization.

3.3 Promoting Proper Hazardous Waste Management

The government should carry out the following actions in order to achieve proper treatment of toxic and dangerous industrial waste generated by factories.

1. Developing administrative tools for government
2. Improving management abilities of business establishments (factories) in SWM
3. Promoting investment in environmental control in business establishments (factories)
4. Promoting the development of treatment facilities for special waste

3.3.1 Development of Administrative Tools for the Government

1) Objectives

In order to address environmental pollution caused by factories, the government should formulate a database including inventories of hazardous waste and prepare instruction criteria.

2) Programs

The following programs should be implemented.

a. Formulating a database system for inventories of hazardous waste
b. Preparation of standards for hazardous waste management, and instructions.

Table 3.3-1 Action Programs for Controlling Special Waste

	1997	1998	1999	2000	2001
a. Database System					
Preparation	↔				
Establishment of a Database System		↔			
Information Gathering		↔			
Operation and Updating of Database			↔	↔	↔
b. Instruction Criteria					
Study	↔				
Preparation		↔			
Orientation			↔	↔	↔

a. Formulating a Database System for Inventories of Hazardous Waste

Based on Chapter 4 of Book 1-Part 2, specification of a database system for inventories of hazardous waste should be considered. The database should be developed by 1998. At the same time, inventories of hazardous waste need to be collected. The database should be in use by 1999.

b. Instructions for Hazardous Waste Management

The government should study research on hazardous waste management technology. Observation should be conducted of domestic inventories of hazardous waste in 1997.

Instruction criteria should be prepared in 1998, and actual instructions based on the criteria should become effective in 1999. These criteria should be integrated with disposal standards.

3) Institutions for Implementation

The Ministry of Environment should set up a hazardous waste control team consisting of three to five staff. A working committee should be established consisting of academicians, private consultants, and industrial engineers. Members of the committee should work closely with the team.

The government should make arrangements to obtain technical assistance from foreign professionals.

3.3.2 Improvement of Management Abilities of Industrial Establishments in SWM

1) Objectives

Top managers of industrial establishments should recognize the need for hazardous waste management. Industrial engineers should be familiar with the basics of SWM. The government should help to develop Morocco's leading industries and engineers in their capacity to undertake SWM.

2) Programs

The following programs should be implemented.

a. Holding seminars for top managers
b. Preparing and providing training courses

Table 3.3-2 Action Programs for Improvement of Management Abilities of Industrial Establishments in SWM

	1997	1998	1999	2000	2001
a. Seminars for Top Managers					
Preparation	↔				
Implementation	•	•	•	•	•
b. Training Courses					
Preparation	↔	↔			
Implementation of First Training Course			•	•	•

a. Seminars for Top Managers

Annual seminars should be held for company executives and top managers on the importance of hazardous waste management. The target number of attendees in the seminar is 500 by 2001. Subjects of the seminar should include on SWM in foreign countries, the benefits that SWM will confer upon companies, and social responsibilities of industry.
The seminar should also cover clean technology, laws concerning trends in waste generation, and case study presentations. Industrial companies should be involved in case study presentation.

Among the participating companies, the government should develop 20 to 30 industrial facilities as model establishments for SWM.

b. Training Courses

Training courses should be prepared by 1998 along with a database system and instruction standards. Training courses should start in 1999 and aim for 100 to 200 trainees by 2001.

Among the trainees, 10 to 20 individuals should be developed as SWM leaders in industry.

3) Institutions for Implementation

The hazardous waste control team of MoE should handle seminars and training courses. Seminars should be held jointly by MoE and the MoC&I, and training courses by MoE in cooperation with MoC&I.

3.3.3 Promotion of Investment in Environmental Control

1) Objective

In order to promote investment in environmental control in industry, consideration should be given to economic measures and formulation of regulations.

2) Programs

Promotion of investment should be preceded by research activities. Consideration should be given to economic incentives such as low interest loans for investment and company tax relief as well as environmental taxes. MoE and MoC&I should examine introduction of such incentives.

Internal rules regarding the level of pollution control in industry should be created, securing fair competition. These rules should be put into effect in 1998 when instruction standards for hazardous waste are scheduled to be ready.

3) Institutional Arrangements for Implementation

Concerned ministries and agencies should set up a internal committee. The secretariat of this committee should be formed by MoC&I and MoE. Industrial internal rules should be created by MoC&I.

3.3.4 Promoting Construction of Special Waste Treatment Facilities

1) Objectives

An action program should aim at controlling environmental impacts. Using the database for hazardous waste, facilities can be developed for waste treatment when this is urgent from an environmental viewpoint.

2) Programs

The following programs should be implemented.

a. Specifying special waste that requires priority treatment
b. Preparing a national policy for treatment of the specified special waste
c. Encouraging factories and private investors to start projects for developing special waste treatment facilities

Table 3.3-3 Action Programs for Developing Special Waste Treatment Facilities

	1997	1998	1999	2000	2001
a. Specifying special waste that requires priority treatment		↔	↔		
b. Preparing a national policy for treatment of the specified special waste			↔		
c. Examining projects for developing special waste treatment facilities				↔	
d. Project implementation					↔

In parallel with preparation of a database of hazardous waste (special waste) and instruction standards, the government should specify waste that requires immediate measures to prevent adverse environmental impacts.

In order to instruct business establishments, the government should, in cooperation with waste generating businesses, private service providers and other national authorities, prepare guidelines. Based on these guidelines, the government should propose specific investment by industry in treatment facilities for special waste.

3) Institutional Arrangements for Implementation

The Ministry of Environment should set up a team to lead action programs in the field of hazardous (special) waste.

The ministry should form joint project teams with the Ministry of Industry and Commerce.

3.4 Establishing Institutions for Infectious Waste Management

Objectives of action programs for establishing institutions for infectious waste management are as follows.

1. Establishment of SWM institutions in hospitals
2. Promotion of infectious waste treatment facilities

3.4.1 Establishment of SWM Institutions in Hospitals

1) Objectives

The government should instruct large hospitals on their responsibility for infectious waste management by preparing and disseminating manuals for internal management. The manuals are for establishing institutions for SWM management and operations in hospitals.

2) Programs

The following programs should be implemented.

a. Preparation of manuals for infectious waste management
b. Development of model hospitals in infectious waste management

Table 3.4-1 Action Programs for Establishing Institutions for Infectious Waste Management in Hospitals

	1997	1998	1999	2000	2001
a. Preparation of Manuals	↔				
b. Development of Model Hospitals		↔	↔	↔	→
c. Seminars for Dissemination		•	•	•	•

The manuals are already in process of preparation by MoH and will be ready in 1997 for practical use. The government should select model hospitals and instruct them to adhere to the manuals by 1998. The results in selected hospitals should be made public, and the manuals should be issued by 1999.

3) Implementing Institutions

A Project team of MoH should implement these action programs with the assistance of MoE.

3.4.2 Development of Infectious Waste Treatment Facilities

1) Objectives

Personnel involved in SWM need to be organized in order to promote infectious waste treatment facilities for private contractors and hospitals.

2) Programs

The following programs should be implemented.

a. Preparation of policies for developing infectious waste treatment facilities
b. Promotion of privatization of infectious waste management
c. Organizing medical institutions

Table 3.4-2 Action Programs for Promoting Development of Infectious Waste Treatment Facilities

	1997	1998	1999	2000	2001
a. Preparation of Policies	↔				
b. Preparation for Privatization					
Bidding	↔	↔			
Construction		↔	↔		
Operation				↔	↔
c. Organizing Medical Institutions		↔	↔		

The Ministry of Health should prepare policies for developing infectious waste treatment facilities and promotion of privatization with concerned ministries and agencies, in particular with MoE.

Developing treatment facilities should be completed at latest by 1999, to start their operation in 2000.

It is necessary to organize medical institutions regionally and to set up a liaison association for infectious waste management. The association would be intended to promote privatization and installation of small incinerators for regional use.

3) Institutions for Implementation

A hospital waste team of MoH should implement the action programs. The Ministry of Environment would be required to participate in examining technical aspects of incineration facility development.

3.5 Increasing Public Awareness

Taking advantage of opportunities created by national holidays and festivities such as Earth Day, public awareness campaigns about waste issues can be launched in cooperation with concerned authorities.

It is necessary to prepare materials for environmental education covering waste issues and to facilitate increased public awareness for this subject in rural areas.

CHAPTER 4 RELATED ACTIONS

4.1 Securing Financial Resources and Building up Cooperative Relationships with Foreign Countries

It is necessary to estimate costs of action programs and secure funds for them. The table below provides a rough estimate of the costs of studies, preparation of guidelines, laws, etc. contained in the national action plan. The total cost is 9.3 million DH; therefore, two million DH is necessary every year. This would account for 10 % of the current budget of the MoE.

Capital investment required for the national action programs is estimated at a minimum to be 200 million DH

Table 4.1-1 Project Costs for Implementing Action Programs

	Duration	Study Costs (,000 DH)	Capital Investment (,000 DH)
I. Programs for administrative system			
A. Preparation of SWM law	2 years	200	
B. Establishment of disposal standards	5 years	1,000	
II. Programs for developing municipal SWM			
A. Improvement of SWM management in urban areas	5 years	500	
B. Introduction of truck scales	10 locations		4,000
C. Construction of controlled disposal sites	5 locations		200,000
D. Instructions for improvement of existing disposal sites	5 years	1,000	Varies by projects
E. Promotion of privatization	5 years	200	
III.Programs for special waste control			
A. Development of waste inventory	5 years	2,000	
B. Improvement of SWM abilities in factories	5 years	400	
C. Instructions for investment in environmental control of factories	5 years	200	
D. Promotion of construction of special waste treatment facilities	5 years	1,000	Varies by projects
IV.Infectious waste control	5 years	800	
V. Increasing public awareness	5 years	2,000	
Total		9,300	200,000

Morocco's national budgetary situation is highly constrained. But the above expenditures are necessary to improve SWM programs. Therefore, the MoE should make efforts to secure technical and financial assistance from foreign countries.

It is also difficult for local governments to secure funds for disposal site construction. The financial system for regional public investment as well as financial policies of local governments should be strengthened. The MoE should enhance cooperation with the Ministry of Financial Affairs and FEC. When domestic capital is not available, the MoE should examine ways to obtain foreign soft loan.

4.2 Implementing Institutions

It is necessary to set up institutions for implementing the action programs. The MoE should employ, at least, the following human resources.

Legal expert	2 persons
Civil engineer or environmental engineer	3 persons
Chemist	2 persons
Information engineer	1 person
Public relations expert	1 person

It is also necessary to set up a steering committee for action programs. The Ministry of Environment should be the secretariat of the committee. The secretariat should report on the progress that each section has achieved. The committee should have the power to approve action programs for the next year and be responsible for issuing necessary instructions after discussion.

It is necessary that the National Waste Committee, which is under the National Committee for Environment, should be informed of the progress of action programs.

4.3 Updating of Plans

In 2001 the government should evaluate the results of the action programs and prepare a second phase of National Action Programs for Solid Waste Management

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