

8.1 Issues

In 1992 the Commune of Safi was divided into three Urban Communes (Safi Biada, Asfi Boudheb, and Asfi Zaouia) and one Urban Community. Accordingly SWM organization is still fairly new, and when it is analyzed this fact has to be considered. During the case study in Safi some major topics and issues have been identified. They will be listed in this section and then explained in the following sections.

1) Specific Organization for SWM

There is no specific organization for SWM in the three Urban Communes of Safi. SWM is a section of the Municipal Works Department, which itself is a part of the Technical Division. The section in charge of solid waste is strongly dependent on the Municipal Workshop for maintenance and repair of its vehicles, and has no independent accounting system.

It is strongly advised that all Communes should consider creating a specific organization for SWM. If this is not feasible because of the size of the Commune, calculations should still be made, based on the true costs of equipment, such as vehicle maintenance, repairs, and loan amortization if any, consumption of motor fuel, and operational personnel. Planning and decision making are only possible if executives have adequate financial information.

Qualifications and responsibilities of SWM management should be upgraded. If there is no specific organization for SWM, operational management is given to unqualified technicians, or to the municipal engineer who may be too busy to devote sufficient attention to solid waste.

2) Clearer Definition of Responsibility

It has been noted, for example, that due increasing solid waste problems, elected Vice Presidents in charge of this matter are more and more involved in day-to-day operations. Awareness of elected people of the real situation in the field is essential, but they should not interfere in technical matters, which are the responsibility of the Technical Division.

It would be useful to issue a statement defining the responsibilities and duties of the Communal Administrative Departments, as well as the relevant procedures. In addition to this statement and the organization chart of the Commune, a definition of the responsibilities and duties of each department manager and section head should be prepared. This last document is a good opportunity for the President of the Commune to make it clear how far he is ready to delegate his decisional power to subordinates.

3) Planning and Decision Making

The communal administration does not formulate plans or strategies (either short or medium term) for SWM, an exception to this being where FEC borrowing is proposed, in which case evaluation of financial requirements for the next few years will be requested. It is suggested that the Ministry of Interior elaborates a standard document to be completed by the Communes as a SWM plan for the next five years.

This document will be one element of decision making preparation on SWM policy. Another element will be that described in Section 1 "Specific Organization for SWM", namely an independent system for estimating SWM costs. The best indicator is the unit cost spent for collection and disposal of one ton of waste (Dirham/ton).

4) Coordination between the Urban Community and Urban Communes

According to the 1976 Law the Urban Community is in charge of disposal. Because of lack of available and suitable space on the Urban Community territory it will be necessary to find sites in other Communes. This situation will have institutional and financial implications.

From an institutional point of view it will be necessary to expand cooperation on SWM to include other Communes (urban or more probably rural Communes). Inter-communal arrangements for joint development and use of a disposal site, for example association of communes, will be more convenient than the Urban Community structure.

On the financial side, disposal costs have to date been rather limited, because no special precautions have been taken to protect the environment. When using sanitary landfill standards, which are strongly recommended, these costs will rise sharply. There may be a case for some subsidy from the national government, particularly where populations outside the Urban Community are affected.

5) Human Incentives for Work Management

Promotions and salary increases for local government officials are limited in accordance with present national regulations. However, one of the main factors in improving the quality and efficiency of SWM is involvement of the personnel. To obtain this involvement, and because this sector is not considered highly by the public, it is necessary to upgrade the skills of those involved in SWM by giving adequate training and more attractive pay.

Upgrading SWM personnel will require national legislation based on the example of what was done in France to encourage manual labour during the 1970's.

6) Privatization

The current study found that the efficiency of the three Communes' collection service in terms of unit cost (amount spent for collection of one ton of waste) was not as efficient as expected. The average unit cost of the three Communes is about 300 DH/ton, which is about 50 % higher

than the contract price (DH 200/ton) to be agreed between the Urban Commune of Ain Sebaa of Casablanca and a contractor. The three Communes should consider privatization of waste collection. Section 8.4 discusses the necessity and steps to be taken to for privatization.

7) Financing

Present levels of expenditure on SWM in Safi represent between 1 and 1.5 percent of per capita income and between 10 and 22 percent of public revenues in the three Communes. Improved and expanded service will place an increasing fiscal burden on the city; efforts must therefore be made to improve management efficiency. Central to this is the system used to account for and monitor progress in financial terms, referred to in 1) and 3) above. Other financial issues include the scope for user charges, the need to develop capacity for investment appraisal, some matters relating to contracting, and improved tax collection performance. However, implementation of many of these recommendations requires reform of local government financial operations as a whole.

8) Municipal Decree and Local Legislation Concerning SWM

The Urban Commune of Safi Boudheb issued a Municipal Decree dated August 8, 1995 concerning Health Protection, Protection of Green Areas, and Penalties. This decree is based on the responsibility on Health Protection given to the Commune by the 1976 Law related to Communal Organization or "Loi Communale". The Royal Decree (Dahir) N° 1.58.401 issued on December 24, 1958, updated by Law N°14.88 dated June 25, 1990 gives the right to Communes to fine those who offend municipal regulations related to the preservation of health and protection of green areas. This text should be used as a model for other Communes.

8.2 Organization and Management

8.2.1 Introduction

The case study carried out in Safi has been very instructive because each of the three urban communes of the agglomeration offers a different approach of SWM. The commune of Safi Boudheb has inherited the administrative structure which was in charge of the management of the city before its division into three urban communes. It has a skilled team of employees with a good experience in SWM. They have equipment suitable for collection of household waste. They are planning to make improvements each year : in 1996, the commune purchased collection trucks equipped with waste compacting system, in 1997, 300 rolling containers will be provided.

The commune of Zaouia must face up to many priorities because it must set up infrastructures necessary for the smooth running of a densely-populated city : roads, schools, administrative buildings, public utility services. Among the public utility services, SWM in general and household waste collection in particular are part of these priorities. The commune is in short of facilities fit for waste collection; as a consequence, a good deal of these wastes are not collected by the Municipality teams, and are accumulated in illegal dumping sites or black

points. One of the targets to be achieved for the persons in charge is to get ride of these black points.

In comparison with the former commune, the commune of Safi Biada faces a lack of financial resources. It is not in a position to purchase new facilities of collection on his own investment budget, and has to prepare a document in order to apply for a loan from the FEC for the purchasing of the equipment which are necessary. As it must strictly manage its resources, executives are aware of the fact that the population's involvement in the cleansing of their commune is an important source of economy of public funds. The lesser the city is getting dirty, less expenses are required for its cleaning. From this point of view, Mr. Mohamed MAGHA the commune's President thinks that public awareness campaigns are a good investment and a priority for Biada.

These contrasted situations in the three urban communes of Safi permit to verify that an appropriate organization and management of SWM provide solutions which answer the different problems of the communes. The following propositions define the institutional organization necessary for the urban communes and the Urban Community of Safi :

- Specific organization for SWM,
- Vice President in charge of SWM and delegation,
- Planning and decision making,
- Coordination between Urban Community, urban commune, and control,
- Human resources management,
- Privatization.

Each proposition will be analyzed successively.

8.2.2 Specific Organization for SWM

The guidelines for the improvement of the Local Governments' SWM insist particularly on the necessity for communes to have a specific organization for SWM. This necessity fulfills three requirements observed in Safi and illustrated hereafter : efficiency of service, cost transparency, delegation of responsibility.

In the communes of Boudheb and Zaouia, vehicles maintenance is carried out by the municipal workshop. The commune of Biada actually uses facilities neighboring those of the Urban Community. The decision of priorities concerning repairs escapes to the department in charge of SWM. In these workshops, there is no management of maintenance and reparation costs per vehicle permitting the realization of a breakdown by activity (public works vehicles, ambulances, sewage tanks, refuse collection trucks, etc.) of the workshop's charges as it is necessary.

The other costs chargeable to SWM are not analytically taken into account : staff expenses, investments depreciation, purchasing of consumable (fuel, lubricating oil, tires, etc.), small equipment. Consequently, executives in charge of communes cannot manage this sector in a rational way. How can we know whether SWM cost per capita is very high in the commune

of Zaouia in comparison with the commune of Boudheb or with that of Biada, if the cost per capita has not been worked out. How can we recruit additional staff for SWM if it is impossible to prove the efficiency of the commune's workers through objective criteria such as the number of tons collected by each worker or the number of citizens served by one worker.

The absence of cost transparency of SWM also prevents the establishment of management by objectives. Definition of objectives is done according to the level of quality which the persons in charge have intended to achieve, and therefore the human and material means which must be implemented to achieve this result. At first, a good knowledge of past and present costs is required in order to draw up the estimated budget. Then, it is advisable to have cost accounting which would permit to follow the realization of the estimated budget during the financial year.

The examples mentioned above show that SWM does not have a specific organization in the communes of Safi. To optimize its efficiency, it must be able to control SWM budget. According to this budget, specific objectives can be defined and assigned to a person in charge. His action will be appreciated according to achievement of SWM objectives.

8.2.3 Vice President in charge of SWM and Delegation of Responsibilities

In the communal councils, the importance given to SWM is expressed by the creation of a Vice President charge responsible of SWM. Awareness of the local elected representatives is a favorable factor which must contribute to improve the situation in this sector. To achieve his optimal efficiency, it is necessary that the role of this Vice President must be well-defined and that his action must complete and support that of the technical departments.

The Vice President in charge of SWM intervenes in three ways. First, he is the vector of decisions of the communal council and his President as regards SWM. He must control their implementation without delay and that the provided means to carry out this must be really mobilized. On the other hand, he must report to the President the information related to SWM, explain to him the problems faced by the technical services, inform him of the achievements of other communes. He also coordinates SWM actions with the Urban Community, or with volunteers on the occasion of exceptional operations like the environment day.

The technical services are in charge of implementing SWM within objectives and budget prepared by the President and voted by the communal council. It is important that management on a day-to-day basis of SWM must be carried out by the technicians who have been assigned this responsibility. The Vice President in charge of SWM has as an interlocutor the Manager of the technical services and his head of department of SWM. He must not intervene directly with other hierarchical levels. He must not interfere in the fields which are purely operational like trips of collection trucks or assignment of vehicles. This kind of interference may lead to some confusion prejudicial to efficiency and may also lead to extra costs.

The involvement of the Vice President in charge of SWM in a level which is not his may give rise to loss of motivation of the persons in charge of operation. To give the best of their

professional skills, these persons in charge need a delegation clearly defined by a procedure. The undertaken actions may have thus durable effects.

8.2.4 Planning and Decision Making

Planning and decision making are two illustrations of what has been explained in item 8.2.3. Decision making must intervene at the level in which problems arise and provide solutions. We distinguish between three levels of decisions : management decisions, intermediary decisions (head of section or department), operational decisions.

If it is important that decisions must be made at the right level, they must also be prepared carefully. The preliminary point is elaboration of SWM master plan. This plan defines the priorities and the necessary means to implement them. So far there is no official forecasting for an estimated budget. As a palliative it is advised in addition to the budget estimate to make some forecasting evaluation on what could be an action plan in SWM during the next 5 years including quality targets and investments.

8.2.5 Coordination Between Urban Community, Urban Commune, and Control

The law dated 30 September 1976 gives a definition of the Urban Community's competencies. It also defines procedures of this community on the basis of a strict equality among the communes whatever is their population. The conditions of their deliberations are similar those of the communal councils. In case of conflict, there is no procedure which permits to overcome the crisis by giving for example a preferential voting to the President of the Urban Community.

The Urban Community has its own budget, supplied with its own resources (cleansing tax "taxe d'édilité", VAT, wholesale market, etc.) to face up to its competencies. It is not provided that it shall proceed to budgetary equalizations among several communes according to their involvement in a project if a consensus has not been reached during the deliberations.

In the field of SWM, the Urban Community is responsible for transfer stations (which does not concern Safi for the moment) and for household waste treatment. Taking into account the lack of availability of lands presenting favorable geological conditions on the community's territory and the constraints mentioned above, the following institutional problems should be solved.

For the availability of land, a consensus must be reached between the Urban Community and the rural commune in which the disposal site will be set up. Arbitration of the Province will be required. To facilitate decision, the Urban Community can propose to dispose free of charge the household waste of the rural commune.

The disposal site management will be carried out by the Urban Community as stipulated in the law dated 30 September 1976, that is to say construction, operation, deposits control, nuisance control. As an operator, it will be responsible in relation to a third party in case of potential environment damage. It shall take the necessary measures so that after the operation period,

site monitoring must be carried out during 20 years to avoid any pollution or accident.

This disposal site will serve as pilot for the other communes of Morocco; therefore, its management should be done with particular care. Considering this constraint, an exceptional help may be allocated by the Ministry of the Interior, which is the ruler ministry of the Local Governments.

8.2.6 Human Resources Management

All the persons in charge of SWM, elected representatives and technicians, agree on the importance of personnel motivation. This motivation is an essential factor for the improvement of services. The motivation possibilities offered within the framework of the status of the municipal employee's service are few. Promotions in rank and salary increase are limited. That is why the persons in charge of communes should use palliatives such as : bonus on dirty works, advance on salary, loans without interest.

To proceed to a significant adjustment of the material conditions of SWM employees, a law is required to adapt the status of the public service for this category of staff. The King's letter dated / / concerning cleansing has shown the importance given by the supreme authorities of the Kingdom to this sector. It is reasonable to think that if the elected representatives of communes and Local Governments ask, on the occasion of the assembly organized by the Ministry of the Interior, for the elaboration of a law on this matter, this request will have a good probability to be accepted.

8.2.7 Privatization

All over the world, there is a strong tendency towards the privatization of public services. Morocco cannot escape this evolution. This matter has been tackled with executives in charge of the communes of Safi; it will be analyzed in Section 8.4 Privatization.

8.3 Financing Issues

This section indicates the present level of expenditure on SWM in Safi, in light of total public revenues available, and of rough indications of household income. Improved and expanded service, particularly with regard to waste collection/street sweeping in the poorest Commune, and disposal for the Urban Community as a whole will place an increasing fiscal burden on the city; efforts must therefore be made to improve management efficiency. Central to this is the system used to account for and monitor progress in financial terms. Other financial issues include the scope for user charges, the need to develop capacity for investment appraisal, some matters relating to contracting, and improved tax collection performance. Implementation of many of these recommendations of course requires reform of local government financial operations as a whole; indeed, the solid waste sector illustrates the urgency of generic reforms.

8.3.1 Affordability

One of the most fundamental issues with regard to financing is the affordability of a satisfactory SWM system. The ability of different Communes to pay for public services varies enormously throughout Morocco, and some variation is also exhibited by the three Communes in Safi. Rough estimates of household income have been obtained from the Citizens Awareness Survey, conducted in late 1996, which suggests median household incomes of about 1,500 per month in Biada and about 2,500 DH per month in Boudheb and Zaouia (the latter being about 60% of the national average). Estimated revenues from taxes, fees and central government transfers for the three communes as well as the Urban Community are shown in the following Table, in which a distinction is made between assessed revenues and actual collections (the latter being 80% of the former).

Table 8.3-1 Public Revenues Reported by Communes and Urban Community of Safi Fiscal Year 1996-97 (estimated)

Unit: Thousand DH

	Boudheb	Zaouia	Biada	U.C. Safi
Total Assessed	29,316	35,284	16,836	34,136
Per Capita Assessed	275	335	244	121
Total Actual	23,453	28,227	13,469	27,309
Per Capita Actual	220	268	195	97

Note: Due to a change in the definition of the fiscal year, the fiscal period is from January 1st 1996 to June 30th 1997; the above data however refer to the annual equivalent of the estimated expenditures for this period.

The cost of existing solid waste operations also varies between Communes, with the lowest income Commune, Biada, showing significantly smaller expenditures than Boudheb and Zaouia. This is summarized in Table 8.3-2, which also reflects the fact that the bulk of SWM activity is in collection/street sweeping (Commune responsibility) rather than disposal (Urban Community responsibility).

Table 8.3-2 Cost of SWM: Communes and Urban Community of Safi, 1996
Unit: Thousand DH

	Boudheb	Zaouia	Biada	U.C. Safi
Disposal:				
Operating Expenses				165
Depreciation				329
Collection:				
Operating Expenses	3,859	2,885	1,774	
Depreciation	1,032	675	404	
Street Sweeping:				
Operating Expenses	1,695	129	350	
Depreciation	0	0	0	
Total Cost	6,586	3,690	2,527	493
Cost Per Capita/year (DH)	62	35	37	17

Data shortcomings mean that the estimates, particularly in Table 8.3-2, are very rough; however the two tables suggest that existing expenditures on collection and street sweeping are equal to about 22 % of total (assessed) public revenues for Boudheb, 10 % for Zaouia, and 15% for Biada. Waste disposal carried by the Urban Community represents about 1.5% of its annual revenue.

Financial accounts of the Communes and Urban Community tend to underestimate true costs; for example, depreciation is rarely reflected adequately. Other costs for 1996 are understated even in the above table, in particular the use of national promotion workers, the cost of which was borne by the central government, but which will be borne by the Communes after 1996. Nevertheless, it seems clear that although SWM costs account for a significant proportion of local government revenues, they are a small proportion of household expenditures; averaging disposal costs across all three communes, these correspond to about 1.5% of per capita income in Boudheb and Biada, and 1.0% in Zaouia. This suggests that, particularly in those areas in which SWM is relatively adequate, substantial improvement in service is likely to be quite feasible in a financial sense. The financial feasibility of projected increases in expenditure that are associated with the proposed improvement in solid waste services, and issues relating to the role of the national government in earmarking subsidies for SWM are discussed in Section 9.3 below.

8.3.2 Accounting Procedures

A survey of financial practices conducted in Safi asked if the accounting system used at the commune level makes a clear distinction between the costs of solid waste management and those of other commune activities. In fact, the study revealed that there is no separate accounting for different services provided at the local government level. In practice, there is a great deal of sharing of equipment and manpower. Also, local government accounts only

show cash costs, primarily salaries, consumables, and spare parts, and recently, interest payments to the FEC. Disaggregation of local expenditures are typically in terms of inputs (personnel, vehicles, etc.), rather than outputs. True costs of services are thus not represented in accounting systems, which therefore provide inadequate information for planning and management of specific services, such as solid waste management.

For local government operations as a whole, it would be desirable to introduce output budgeting and to clearly distinguish the costs of different services provided at the local level. True costs of solid waste management and other local government activities, including capital costs, should be clearly understood to facilitate planning. Although immediate implementation of such reforms will be beyond the institutional capacity of most local governments, some basic steps in this direction might be made even in the poorer communities, where, in fact, the need to know where funds are being spent is the most urgent.

While it may not currently be feasible to have profit centers for all activities in which costs and revenues from user charges are identified for different types of service, it is nevertheless desirable to identify those aspects of SWM operations which can be so classified. Expenditures related to industrial SWM may already begin to fall into this category within those jurisdictions in which large industrial complexes are situated; more generally, this issue will become of increasing importance as industrialization in Morocco proceeds.

While accounting reform is in general desirable for most local governments in Morocco, the most useful recommendation is not to introduce more complex accounting systems, such as accrual or capital cost accounting, which will often create major administrative difficulties and delays, and give misleading information. If accounts are to be useful, they must be produced punctually, and their complexity must be tailored to the skills and equipment available, as well as the ability of decision makers to use the information generated. So it is usually most useful to concentrate attention on building upon existing systems, updating them, and gradually introducing improvements in financial records. At a minimum, the following should be attempted within the three Communes and the Urban Community of Safi:

- distinguishing between SWM costs and other costs incurred by the Communes and Urban Community
- distinguishing between various components of SWM costs, such as operation and maintenance costs, and loan amortization, as well as non-cash costs, such as depreciation
- allocating costs between broad categories of waste dischargers, such as industry and households
- developing indicators of service efficiency in cost-output terms which allow comparisons to be made over time

Accounting reforms of the above kind are not only desirable in themselves, but will also help lay the foundations for possible subsequent re-allocation of responsibility to private sector or commercially oriented operations, which are generally accepted as being more efficient. Indeed, privatization, by lowering real costs of solid waste management operations, may be one means of alleviating the financial burden implied by improved service. Issues to be addressed include, above all, clear legal definition of waste management standards and

responsibilities, and removal of impediments to entry such as difficulty of entering into multi-year contracts, and the social implications of a probable reduction in labor force if private operators are involved.

Accounting reforms will assist possible privatization initiatives since they provide a more accurate estimate of the real financial costs of providing services. Existing budgetary procedures tend to be inaccurate estimates of real financial costs. Thus capital costs tend to be understated, with interest and depreciation often not being reflected in public accounts. (However, in terms of social costs, these effects may be offset to the extent that wages for unskilled labour are higher than their opportunity cost, which is apparently the case in Morocco, where urban unemployment is about 16%).

8.3.3 User Charges for SWM

There are no examples in Safi of any user fees, taxes, fines or other penalties, or income from sales that are specifically related to solid waste. Thus there are no charges for household collection, no tipping fees for industrial waste discharge, no penalties for illegal disposal, and no fees for industrial or hospital collections. No instance was cited in which local governments profited from sales of recyclable material or compost, nor were there any examples of deposit-refund systems which may be introduced either at the local or national levels, and which are discussed in the chapter on national level actions above.

It is however useful to consider possible introduction of mechanisms at the local level for raising revenues and at the same time encourage more efficient use of resources by recycling as well as actual reduction of waste discharged. Criteria for determining the appropriateness of such mechanisms include environmental effectiveness, economic efficiency, administrative feasibility, political acceptability, and financial feasibility.

In principle, charges should be based upon the economic costs of the service provided. However, with regard to household waste, there appears to be no real prospect of charging individual householders on the basis of the amount of solid waste they generate. To do so would invite illegal dumping and evasion of payment for services provided. Similarly, there seems to be little scope at the moment for separately earmarking revenues for solid waste management as far as residences are concerned. However, as financial management improves, with more accurate costing of the services provided for different beneficiary groups, identification of both the costs and potential revenues from households will become increasingly feasible, and indeed a necessary precursor for possible concessionary arrangements with private sector operators.

Much illegal dumping takes place, in part due to the inadequacy of existing collection and disposal systems. Financial instruments to deter this could be in the form of financial penalties for such activities.

In the future, there may be some prospect of collecting fees from industrial waste dischargers on the basis of the total costs they impose. However a distinction should be made between two categories of industrial waste. The first category, which can be specified as "industrial"

will be defined in future legislation. It is recommended that industry will continue to assume financial and environmental responsibility for disposal and treatment of this category of waste. However, industry will also be increasingly responsible for generation of waste that can be collected and disposed of along with household and other conventional municipal waste, and thus be dealt with by the municipality, or a contractor employed by the Urban Community of Safi.

Where public sector management of industrial solid waste is involved, the contribution of various sectors to the total waste load and costs of collection and disposal must be assessed. The feasibility of introducing charges for each type of user should then be tested. A possible result will be to find that with regard to industrial waste, user charges, whether in the form of tipping fees, based on quality and type of waste, or collection fees based on volume, are administratively feasible, and sufficient to cover the total costs involved. For this to occur, a monitoring and regulatory system adequate to prevent evasion of payment and illegal dumping will have to be developed; in practice the first priority should be given to those industries that produce the largest volume or most environmentally damaging waste.

8.3.4 Investment Decisions

Before the recent reform of the VAT distribution system, local investments financed by the VAT were subject to exceptionally close scrutiny by the Ministry of Interior, which placed high priority on those projects with significant national and regional benefits. The reform in the VAT system now gives much greater freedom to local governments; the Ministry of Interior continues to play an important role in the approval of capital expenditures, but it is planned to reduce this over time. Investments proposed for FEC financing undergo the highest degree of scrutiny; it should be noted that one of the requirements of the FEC is that the borrower has an acceptable debt service ratio. In this respect, local governments in Morocco tend to be in a relatively healthy position, since to date borrowing to finance local investments has been minimal.

In view of the reduction in real terms in local government capital expenditures in recent years, combined with the large projected increase in investment requirements for solid waste, there is an urgent need to create conditions under which capital investment can be accelerated and effectively implemented. This requires upgrading of the capacity of local authorities and specifically training in investment planning and project implementation. In this regard, the FEC has a major role to play in making efficient decentralization a reality.

Investment projects for SWM must be built upon forecasting of the relevant "market". Demands for services and acceptable standards are continually changing as incomes increase and industrial structures change. Changes in demand as well as in the composition of waste generated imply that there should be a permanent capability to keep track and monitor different components of demand. Skills must be developed to compare the costs of alternative means of dealing with solid waste problems, taking into account both the relevant capital and operating costs, and discounting costs back to present worth equivalents over the lifetime of the alternatives being considered.

The selected investments should always be compared systematically with the benefits of the services they provide. With rare exceptions, however, it is not recommended that local governments engage in sophisticated valuation methods, but should concentrate on the achievement of cost-effective means of meeting given targets or standards for collection and disposal of solid waste. Financial analysis should accompany the economic analysis at all stages; in particular, the implications of the project for local budgets and capacity to meet operating and maintenance costs as well as to cover investment costs should be specified and agreed before embarking upon the project.

Developing this local capacity is essential. It is critically important that investment in SWM, as in any other area must be demand-driven, not supply-driven. While it may be useful for the national government or FEC to identify targets for SWM, individual investments should not be pushed on local governments by the financing agencies concerned. Building capacity at the local level for investment appraisal will ensure that this does not happen.

8.3.5 Contracting

Currently, with a few exceptions, local governments in Morocco not only have the responsibility, but also carry out actual implementation, of SWM activities. There is thus little experience in contracting out services to private contractors. This process requires that tasks to be performed are clearly specified in terms of geographical coverage, frequency and performance standards, and that performance can be measured. It is extremely important that the bidding process is transparent and that there is a clear separation between the authority issuing bids and the potential contractors.

To give contractors adequate incentives to engage in long term planning it is necessary that contracts can be renewed if performance is satisfactory, and that the contract periods themselves are long enough to cover the amortization of invested capital. In the past in Morocco this has sometimes been prevented by the Ministry of Interior; indeed there may be good grounds for this if the local authority does not have the capacity to evaluate bids or investment programs adequately. Competition is essential; one way to achieve this in larger jurisdictions by dividing the municipality into zones which are served by different contractors, or by the municipality itself. This "contestability" has been shown to be effective in some developing countries' SWM operations, and in France for water supply.

8.3.6 Revenue Collection

As indicated by Table 8.3-1, collection of local taxes requires improvement. Nationwide, total revenues generated by locally-administered taxes and fees in 1993 amounted to 1,665 million DH. This refers to revenues actually collected; however, tax assessments in that year were 2,106 million DH. As in the case of the three local taxes administered by the central government, there was thus a significant shortfall in revenue collection, in this case being about 21 percent. Similarly, the Commune of Boudheb stated that actual revenues are less than 80% of assessments. This situation poses a major problem for the adequate delivery of local services, including, of course, solid waste management.

8.4 Privatization

8.4.1 Need for Privatization of Waste Collection Service

It is recommended that the three communes of Safi should consider privatization as a means of improving to improve the efficiency of waste collection services.

Through the current study, it was found that the waste collection services by the three communes are not as efficient as expected. The best indicator for measuring the efficiency of collection service is unit cost per ton, which is calculated by using cost of collection service spent and quantity of waste collected. The study found that the unit cost for each commune as follows:

Table 8.4-1 Unit Costs of Waste Collection Service in Safi, 1996

Communes	Unit Cost of Waste Collection Service (b) ÷ (c) = (a)	Annual SWM Cost (b)	Annual Waste Quantity Collected (c)
- Boudheb:	DH 254/ton	DH 4891116	19292 ton
- Zaouia:	DH 336/ton	DH 3559800	10608 ton
- Biada:	DH 377/ton	DH 2177460	5772 ton
- Average of the 3 Communes:	DH 298/ton	DH 10628376	35672 ton

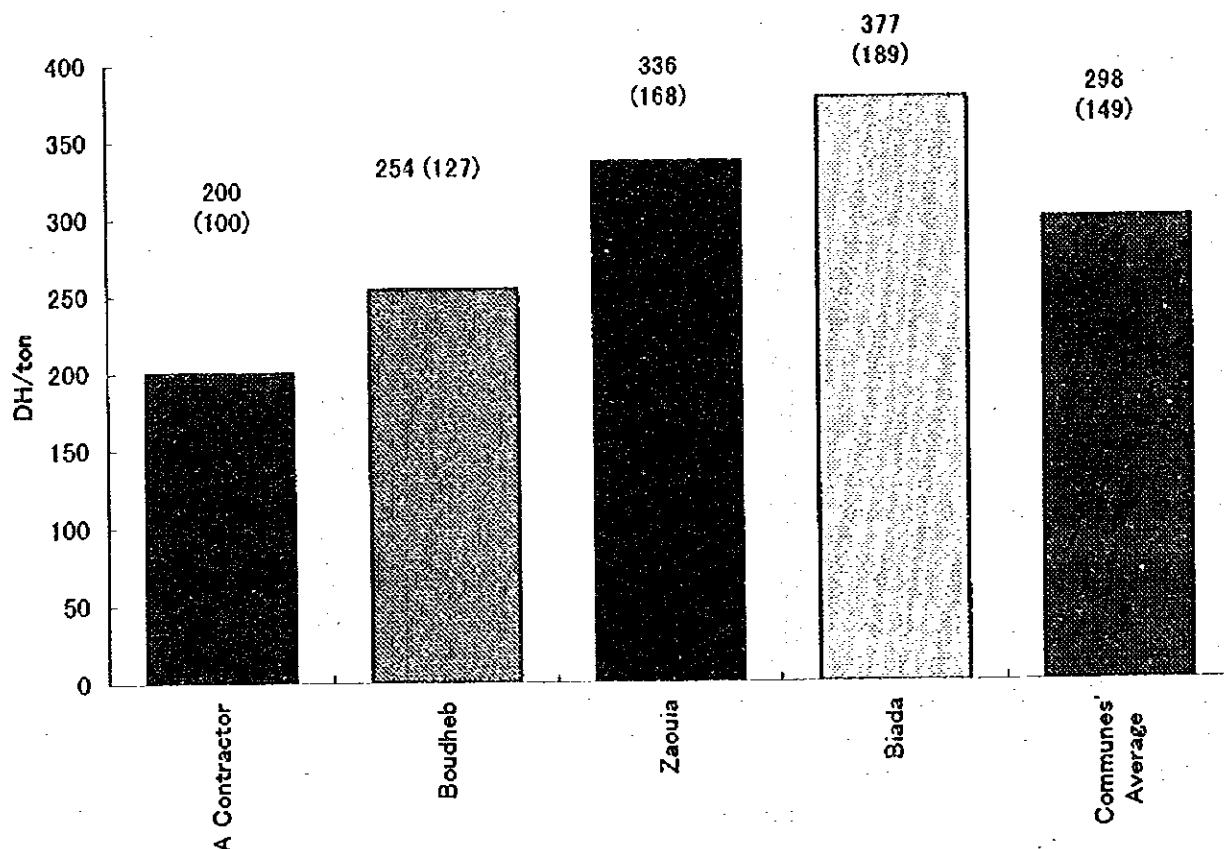


Fig. 8.4-1 Comparison of Unit Costs of Waste Collection Service

Note: Figures in parentheses show indicators (a contractor's price = 100).

The contract price offered by a contractor to the Urban Commune of Ain Sebaa in Casablanca is about DH 200/ton. The both the commune and the contractor are waiting for approval by the Ministry of Interior.

The average cost, DH 298/ton for Safi is about 50 % higher than the contractor's price. This explains why the communes need to consider the privatization of the waste collection.

8.4.2 Steps Towards Privatization

There are two main ways to privatize waste collection service, i.e., 1) use of contractors (contracting out), and 2) commercialization of the municipal collection service (establishment of a municipal company for waste collection and subsequently a private company).

The use of contractors (contracting out) would be easier and probably take less time than the other way, and therefore is more advisable for Safi. Practical steps to be taken for contracting out are as follows:

- Step 1: Knowing costs of waste collection service
- Step 2: Searching for interested companies, and obtaining preliminary offers and information from them
- Step 3: Planning, defining services to be privatized, and tender preparation
- Step 4: Tender execution (announcement, receiving and evaluation of offers)
- Step 5: Negotiation and contract
- Step 6: Monitoring and supervision (after contractor's commencement of service)

Step 1: Knowing Unit Costs of Waste Collection Service

It is necessary for the communes to convince themselves that the privatization is beneficial to the communes. For convincing themselves, the communes must know the unit cost of their collection service, and compare the unit costs with prices that may possibly offered by interested contractors.

Estimating unit costs is necessary also for knowing the efficiency of their collection service, without which the communes would not be able to evaluate efficiency, and may not improve their collection service.

Unit costs of waste collection cannot be estimated without having two types of data; costs of waste collection per period (one year for example), and quantity of waste collected for the same period. It is possible for communes to estimate the costs of waste collection without having a separate accounting system for waste collection service. Costs of waste collection can be estimated on the basis of costs of inputs such as equipment and personnel. The best way to estimate quantity of waste collection is to use a truck scale for a period, one week for example.

Generally, unit costs of waste collection services are significantly underestimated by communes. Such underestimation occurs as a result of 1) underestimation of costs of collection service and

2) overestimation of quantity of waste collected.

Step 2: Searching for interested companies, and obtaining preliminary offers and information from them

There are 2 types of companies which may be interested in waste collection services, i.e. bus service companies and public work contractors. The former has experience in dealing with the public. (dealing with the public is a necessary element of an efficient collection service.) The latter knows tender procedures. (Communes normally contract out collection service through tender.)

Communes may obtain preliminary offers from interested companies either officially or unofficially. Offers should contain prices and conditions of service.

Step 3: Planning, defining services to be privatized, and tender preparation

Communes should prepare a plan concerning:

- size and number of zones (areas) to be privatized
- type of service to be privatized (collection/transport, street sweeping, disposal)

Unclear definition of the service and poorly designed contracts may lead to bad results. The contract conditions should include clear definition and conditions of the service, methods of collection, penalties, contract period, and payment conditions, quantity of waste to be collected by contractors.

Step 4: Tender execution (announcement, receiving and evaluation of offers)

The benefits of privatization of collection service depend heavily on the existence of competition among interested contractors. Tender should be implemented in such manner as to attract many contractors.

Step 5: Negotiation and contract

A serious problem of privatization for communes is how to deal with their existing personnel and equipment. The contract to be made between Urban Commune of Ain Sebaa and a contractor includes a condition requiring transfer of the existing personnel and equipment of the commune to the contractor.

Step 6: Monitoring and Supervision (after contractor's commencement of service)

Experience of Malaysia and other countries shows that the monitoring and supervision of contractors is very important for the communes to have desired results. Contractors should be required to submit monthly reports on their performance (collection quantity and frequency, etc.) to the communes. On-site inspection is also necessary.

Frequency of such inspection may decrease as contractor proves to be more reliable.

8.5 Municipal Regulations

8.5.1 Introduction

Targeting proper SWM implementation in their jurisdictions, the Urban Communes and Communities should set up municipal regulations for cleansing activities to define the authorities' responsibility and citizens' duties. The regulations should cover the scope of responsibility for cleansing services and authority to issue relevant orders. The regulations should also clarify citizens' duties for cleansing activities. Therefore, the regulations can be considered as a contract between the local government and citizens.

Taking into account the current status of Morocco's local government legislation, it is not essential to introduce municipal regulations. The national government, however, should consider the principles contained in the Decentralization Law of 1976 and support local parliaments to establish municipal regulations for cleansing.

8.5.2 Current Situation of Local Laws

Prerogatives of Communes are laid down by the communal charter dated 30 September 1976 related to "communal organization." In Part IV Article 30 Paragraph 2 Section 4, the law specifies that the communal council "determines the creation and the organization of the communal public utility services and their management, either through direct public service or through subcontracting with a private company, or through concession." In Article 31 Paragraph 7, it is stipulated that the council deliberates over the "general rules of roads, construction and hygiene within the framework of laws and regulations in force." However, they can be executed only after approval by the higher administrative authority.

The Royal Decree (Dahir), N° 1.58.401 issued on 24 December 1958, updated by the law N° 14.88 dated 25 June 1990 gives the right to the communes to charge the offenders of the municipal regulations related to prevention regarding health and protection of green areas.

Penalties

Penalties are laid down by the law N° 14.88 dated 25 June 1990, implemented by the enforcement decree N°1.90.91 issued on 9 November 1992. The amount of the fines that the communal authorities have a right to collect is 100 Dirham for offenses to the regulations on the preservation of public health and the protection of green areas.

8.5.3 Urban Communes

Urban Communes' regulations for cleansing activities should address the following.

1) Scope of Responsibility of Communes

Communes are responsible for collection of municipal waste. The scope of this responsibility is basically limited; therefore, it should be clearly outlined.

a. Duties to Maintain Collection and Cleanlines

Communes have the duty within their jurisdiction to collect waste generated from legally constructed buildings and from residents whose tax d'etilite obligations are fulfilled. Whether or not the tax d'etilite is paid, however, Communes have to collect all waste generated as part of their duties is to maintain sanitation in their jurisdiction.

b. Types of Waste to be Collected

There should be a clear definition of waste that communal collection has to deal with. Basically, wastes to be covered by communal service are household waste generated in the communes and other waste that can be regarded as household waste in terms of its waste composition and form.

c. Collection Points

Basically, collection points should be located on public streets facing private buildings

2) Authority regarding Provision of Communal Services

Communes should be authorized to ask waste generators to carry out certain actions in order to properly provide collection service.

Communes should be authorized to do the following:

- Refuse waste in certain cases
- Set conditions for collecting waste (frequency, collection points, containers, and time)

3) Authority concerning Operation of Cleansing Activities

Communes should be authorized to do the following:

- Collect service charges for waste collection
- Provide instructions to waste generators
- Issue orders to control illegal dumping ; and collect costs for restoring damage caused thereby
- Impose fines on persons who dump waste on the street

8.5.4 Urban Community

1) Responsibility

It is desirable to define the responsibilities and powers authority of Urban Communities similar to those described above in regard to Urban Commune. This definition, however, only needs to address factors related to disposal site management.

Urban Communes are responsible for securing lands for disposal sites. The authorities are therefore responsible for taking the environment into consideration when selecting the land and also operating the site.

2) Authority

considerations should be given to authorizing Urban Communities to do the followings

- Refuse waste at disposal sites as necessary (i.e. refusing to accept industrial process waste and special waste)
- Issue instructions to municipalities and waste generators concerning incoming waste (especially generators who discharge hazardous waste mixed with municipal waste)
- Charge a tipping fees when waste is transported to a disposal site by private waste generators/collectors
- Use the private sector to secure land for disposal sites

8.6 Public Education and Awareness

8.6.1 Public Education Actions Regarding Waste

1) Awareness Campaigns

Public education and awareness are generally realized in Safi through actions like eradication of illegally dumped waste, that are organized at the levels of the Communes, the Urban Community and the Province. The cleanliness campaigns that have been carried out in Safi in 1996 are the following:

- The campaigns of cleansing and protection of green spaces organized during the summer of 1996 at the initiative of the Province in cooperation with the Urban Community, the Communes and the provincial delegations;
- The cleansing campaigns that have been launched as a response to His Majesty the King's Letter at the end of 1996;
- The cleansing campaigns organized on the communes' initiative during the year for the collection of waste from streets and for the eradication of "black points" according to the needs.

2) Cleansing Campaigns as Initiated by the Province

Many communes of the Province of Safi have organized cleansing campaigns with the support of the Province and the provincial delegations. The activities were planned between May 25th, 1996 and July 8th, 1996 in commemoration of His Majesty the King's birthday, the Youth Feast and the Earth Day of Environment. The major actions have been the cleanliness of the "black points", the painting of walls and the maintenance of green spaces.

These campaigns have included various activities such as:

- The eradication of "black points" as in the case of Biada, for instance, where 12 days have been devoted to such actions, from June 3rd to June 26th;
- Public meetings concerning topics such as waste treatment and its effect on health or household waste disposal;
- Meetings with women in order to discuss matters of cleanliness and protection of environment;
- Visits directly to homes to increase the awareness of people and advise them to act appropriately for good handling of waste.
- Distribution of waste bags and the setting up of banderols with slogans.

3) Cleanliness Campaigns Initiated by HM. the King's Letter

In November and December 1996, the communes were advised by HM. the King's Letter to take measures to eradicate the black points. A whole series of campaigns have been organized in the communes of Safi to respond to this advice.

For instance, in Biada, the removal of household waste from black points was organized in 18 sessions, from November 24th to 27th and from December 5th to 18th in the 1st arrondissement and from 7th to 15th November in the 2nd arrondissement. In Zaouia the JICA Study Team has been able to attend in November 1996 a cleansing campaign, which was executed in the surrounding of the Safi airport, within the scope of measures taken to eradicate "black points".

4) Cleanliness Campaigns from the Viewpoint of the Public

The household survey has, in part, dealt with the households' opinions concerning the awareness campaigns. About 70% of the persons who answered mentioned that they remembered the campaigns. Among these persons, 85% said that they were aware of the messages of these campaigns. The answers concerning the time of campaigns are consistent with the campaigns that have been carried out during the summer and at the end of the year 1996 for Boudheb and Zaouia. In the case of Biada, most people did not recall the cleanliness campaigns that had been implemented.

Concerning the tools used for the implementation of the campaign, loud-speakers and television prevail (about 70%). At a secondary level, we find posters, meetings with the public, and households.

8.6.2 Results of the Awareness Actions

1) Summary of Cleanliness Campaigns

The results of campaigns are not clear because:

- There has been no evaluation;
- It is difficult to make a judgment about recently completed campaigns;
- The contribution of awareness measures taken to solve problems is not separable from other measures.

The short-term effect of the campaigns of eradication in the waste dumping areas in 1996 seems to be positive at the date of February 1997. Some sites have been restored. For the longer-term, prior experiments have shown that the result has generally been limited. The eradication of waste dumps apparently serve to keep the cleanliness level at its present state, which depends on variable factors like the quality of the waste collection service and the behavior of citizens in handling their waste. These actions do not eliminate the problems that we seek to solve.

2) Results of the Household Survey

The answers given to the questionnaire show the following:

- The results concerning the influence of campaigns on opinion or behavior are rather confusing;
- Almost 20% of people think that the campaign has not had any effect on them and 39% did not answer. Among the persons who consider that they have been influenced by the cleanliness campaign, 75% think that this influence has been on their opinion.
- The influence on behavior is practically worthless (less than 2% of those who answered)
- About 91% of answers mention the lack of communication. Only 10% of the persons who think that there is communication with the collection service cite the awareness campaigns.
- More than half the persons who considered that there was some communication, stated that communication was about the waste collection time.

If we attempt to summarize roughly the answers given in the questionnaire, we note that residents have perceived the awareness campaigns favorably outside Biada, but that these campaigns have improved neither communication nor participation. In terms of public awareness, the impact of these campaigns seems to have been limited. This result is probably related to the fact that the campaigns are primarily campaigns for the removal of waste with no strategic support of public awareness measures.

3) General Summary

Table 8.6.1 shows the types of actions that are generally taken in Safi during the campaigns in order to solve the existing problems of SWM. We note that these campaigns concern site

restoration more than general awareness. In certain cases, some preventive actions have been added to these measures of waste removal.

We note the lack of the following elements:

- There is no precise objective to create awareness nor a plan of action;
- The existing cleanliness campaigns generally constitute complementary measures to the normal service of collection rather than measures of awareness;
- Restoration actions, which are meant to grapple with the consequences of the problems; for example, the eradication of black points, are well realized. However, prevention, which is meant to grapple with the causes of the problems, is not sufficient in the field of public education.

Table 8.6.1 Summary of the Types of Awareness Actions Applied or to be Applied in Safi

		Actions already taken	Actions to be taken
Problems and their consequences	<ul style="list-style-type: none"> - Black points - Unhealthiness of dustbins - litter in street 	<ul style="list-style-type: none"> - Campaigns of eradication of black points 	(Management plan measures)
Causes of problems	<ul style="list-style-type: none"> - State of roads - Insufficiency of collection; - Negligence of residents; - Lack of communication between the commune and residents 	<ul style="list-style-type: none"> - improvement of collection service - Slogans (bandoles or loud-speakers); - Meeting with the public; - Posters. 	<ul style="list-style-type: none"> - Information of the public; - Dialogue between the commune and residents; - Identification of objectives and arranged actions; - Greater motivation of communes.

8.6.3 The Major Problems of Public Awareness

The major problems of public awareness in Safi can be summarized in the following way:

- Lack of communication between the residents and the commune;
- Inadequate public participation in collection operations and maintenance of the cleanliness of the public areas;
- Inadequate public education and awareness within the framework of cleanliness campaigns that are organized by communes;
- The lack of a strategy of awareness and education about the matter of solid waste. Awareness actions are principally isolated actions that accompany the activity of eradication waste dumping areas;

- The insufficiency of making use of the provincial delegations abilities for an integrated work of awareness in terms of the matter of solid waste at the level of the city of Safi;
- Sometimes the poor conviction of communes about the necessity of public education measures to implement the SWM level;
- Lack of evaluation of the results of the cleanliness campaigns;
- Lack of continuity of actions, which gives limited results to the issue of campaigns and, therefore, underestimates the usefulness of awareness campaigns.

8.6.4 Possible Solutions

1) A More Global Approach to Information and Communication

A more inclusive approach to information and communication seems to be necessary. The residents already constitute the target of the awareness efforts in order to improve bodily hygiene and food hygiene and even environmental hygiene. These objectives especially concern the private domain in such a way that everyone can feel directly concerned with the measures to be taken by individuals.

In the case of urban waste, citizens' attitudes tend to be about the quality of public service and the benefits are not easily perceived at the level of the individual. Individually, the residents think that maintenance of cleanliness is exclusively a public responsibility service. We understand that in this precise case, awareness creation cannot be done in the same way as for health or hygiene.

The act of making recommendations (e.g. do not throw waste) already presupposes a higher level of awareness of the general interest and civic duties. In fact, this requires a mentality and attitude which is possible only when the duty of collective responsibility has the upper hand. Such awareness becomes possible only within the framework of the relationships between residents and the authorities through dialogue and advanced communication.

The point of the awareness campaign is therefore to start by encouraging such dialogue. This concerns a step that should be continuous and which will be useful for stimulating the encouragement of the impact and effectiveness of the attitude and behavior messages within the framework of, for instance, the promotion of a new collection system. Besides public awareness, environmental education at school is necessary.

2) Priority Actions

Health status has many determinants, including the management of waste collection and the attitude of people with respect to waste. The objective of improving SWM thus depends on the different measures taken to manage both the causes and the consequences of the existing problems.

Actions relating to education and awareness for the improvement of SWM should be identified and organized in accordance with the development of the plan of public education and with the adoption of the measures of a SWM improvement plan. A plan means the

working out of objectives, the choice of targets and means, the evaluation of results and the appropriate organization.

Public education could be organized at several complementary levels:

- Regular actions for cleansing neighborhood sites through cooperation between people and the commune. Such actions, like eradication of "black points", are already taken but should be continuous and improved as regards the participation of the public.
- Permanent action for the improvement of communication between residents and the commune and information about SWM. This action can be led by the Urban Community.
- Establishment of environmental education activities at school, taking benefit of the know-how of teachers, coordinators of the Delegation of National Education, and municipal actors in the field of SWM.
- Isolated and well targeted actions to accompany the other measures of SWM improvement. It is at this level that the awareness measures support the technical measures of SWM improvement as, for instance, getting the public understanding and acceptance about SWM objectives or by accepting innovative measures in the collection system, or more simply getting cooperation of the people against street littering. The commune is the first level of government concerned with this type of action.

3) Necessary Conditions for Implementing Actions

The feasibility of such actions for organizing public education is based on a set of conditions like:

- making available on the part of urban communes and urban communities an annual fixed budget dedicated to the production of awareness and education materials;
- studying problems related to the lack of public participation and its causes in order to identify appropriate actions for heightening public awareness;
- producing data about awareness and education, like for example the quantity of waste collected during a cleansing campaign, the number of "black points", the rate of public participation in activities, and the educational activities developed at school; these data are necessary for the evaluation of the results of awareness heightening and education;
- organizing a permanent committee in order to make sure that efficiency and continuity of actions will be reached;
- developing an integrated approach toward education and communication in the field of SWM, including aspects like the institutional development of public relations, the integration of environmental education into the general school education, the broadening of objectives of actually existing cleansing campaigns, and the preparation of plans for public awareness heightening.

The objective of information and communication cannot be achieved solely by awareness campaigns. Institutionalization of these activities is necessary at the level of the Urban Community. Some measures for education of children at schools are also necessary.

On the other hand, the awareness campaigns are well adapted to precisely targeted actions. The communes should develop their capacity of planning and organizing these actions by using the know-how and the existing networks of provincial delegations.

A committee for identification of the objectives of awareness and education in the field of waste should be set up at the initiative of the Urban Community. The committee should be comprised of the communes, the provincial delegations and local associations under the presidency of the Urban Community. Its function would be to take care of the realization of the objectives of public information and communication between the commune and the residents, on the one hand, and to facilitate the identification of projects and their realization within the framework of the communal activity, on the other.

4) Objectives

The awareness and education objectives can be formulated according to the problems raised, to the action levels previously presented or according to the priority targets.

The following objectives should be considered as having priority:

- To better inform the public and create better conditions of communication between the commune and the public;
- To make the communes understand the usefulness of public education;
- To launch awareness and education actions in accordance with a pre-defined strategy or a pre-established plan;
- To better integrate the intermediate targets into the actions of awareness, namely women, children, coordinators of provincial delegations, the elected representatives of the communes, and the associations;
- To integrate environmental education into the general curricula at school;
- To increase the awareness of waste collectors within the framework of measures that will aim at the improvement of their working conditions and the improvement of their image in society;
- To better use local competencies and resources so as to develop capacities to identify objectives, and to plan and execute the actions; to better integrate and encourage the local associations with respect to the planning and execution steps;
- To develop the financial, technical and institutional capacity for producing educational materials.
- To better develop the exchange of ideas and information with other communes.

8.6.5 Continuity and Evaluation of Awareness Campaigns

Continuity and evaluation of awareness campaigns are sensitive aspects for the successful achievement of the assigned objectives. These aspects are explained in more detail in other parts of this report.

Measures needed to ensure continuity are various. For example, measures can be the setting of a follow-up committee and support of local NGOs. They can include provision of regular

public information. They also can be the complementarity of awareness tools or the use of a mascot.

The evaluation of campaigns provides:

- an incentive to continue the actions;
- a statement of the situation and a judgment about the usefulness of actions already underway
- an improvement of the awareness actions;
- a justification of the usefulness of public awareness heightening.

Evaluation criteria must be defined at the following levels:

- efficiency of the organization which has been set up;
- achievement of the objectives of execution of the campaign;
- achievement of the objectives of public awareness.

Aspects and criteria pertaining to evaluation are presented in part B of this report. There are no specific criteria for evaluating the achievement of public awareness objectives. They may include, for example, the change in the rate of waste collection, the general conditions of cleanliness in the city, the number of "black points", or the change of sites classified as "black points". Measurement of the effects of campaigns in areas with low participation of the public or with insanitary conditions is a priority.

8.7 Control of Waste generated by Industrial and Other Establishments

8.7.1 Responsibility for Control of Waste from Industrial Waste and Other Establishments

Various actors have a role to play in respect of solid waste generated from factories and commercial and business activities in the city of Safi: namely, businesses, the Urban Community, Communes, the Province, and the Ministry of Environment. They are responsible for SWM and/or for control of such waste. Details of such responsibilities are noted below.

- 1) The Urban Community, which supervises operation of its disposal site, has responsibility for the following aspects of industrial waste control.
 - Presenting criteria for incoming industrial waste at the municipal disposal site
 - Instructing communal trucks not to collect waste that fails to meet the Community's criteria
 - Instructing businesses to separate waste that does not meet the Community's criteria

- 2) Communes have responsibility for the following duties.
 - Refusing to collect certain types of waste as defined by the Urban Community
 - Instructing generators to collect non-household types of process waste
- 3) The Provincial Government and the MoE have the responsibility for the following management activities concerning waste that is not disposed of at the municipal disposal site.
 - Setting SWM targets for businesses
 - Approving and supervising SWM by businesses

8.7.2 Classification of Industrial Waste and Risks to Environment

1) Waste from Industrial Production Processes

One of the largest chemical factories of phosphoric acid fertilizer in the world is located in the city of Safi. Other main industries in the city are food processing, textiles, pottery, and plastic injection forming.

a. General Industrial Waste

"General" industrial waste is defined as industrial waste that is generated from production processes and does not require neutralization or stabilization for environmental purposes.

The phosphoric acid fertilizer factory discharges a large quantity of liquid gypsum waste into the ocean without special treatment. Although waste gypsum is harmless, its discharge to the ocean may negatively affect the area's productivity and may be related to the decrease of fish stocks along the coast of Safi. Once regulations are imposed on the turgidity of liquid waste discharged there, a large amount of gypsum sludge will be generated after treating the liquid waste. The sludge is harmless and will not cause any environmental risks at the disposal site; however, the amount of the sludge will be so large that the municipal disposal site will not have enough capacity to accept the waste. Therefore, the sludge should be treated by its generator.

Other factories generate plastic waste and other articles (i.e. expired canned food and pottery). Communes should not include these wastes in their waste collection because they are discharged irregularly. Such waste is almost harmless to the environment when disposed of at the municipal disposal site.

b. Special Waste

According to our surveys, factories in Safi do not use any hazardous materials. Although it is not yet legally defined, special waste is defined as hazardous waste that requires special treatment of neutralization or stabilization. Factories in Safi do not generate such waste.

c. Municipal Waste at Factories

Certain waste is generated at factories for workers' household activities or from office

activities. Such waste can be included in the category of municipal waste.

d. Demolition Waste

Demolition waste is generated from construction work and public civil engineering work. Although the waste is totally harmless, its generation is irregular in terms of time and place. Also, the waste is generated in a large amount at one time. When amounts are dumped near residential areas, dust will emerge as a risk to the living environment.

e. Hospital Waste

Types of hospital waste can be classified as below.

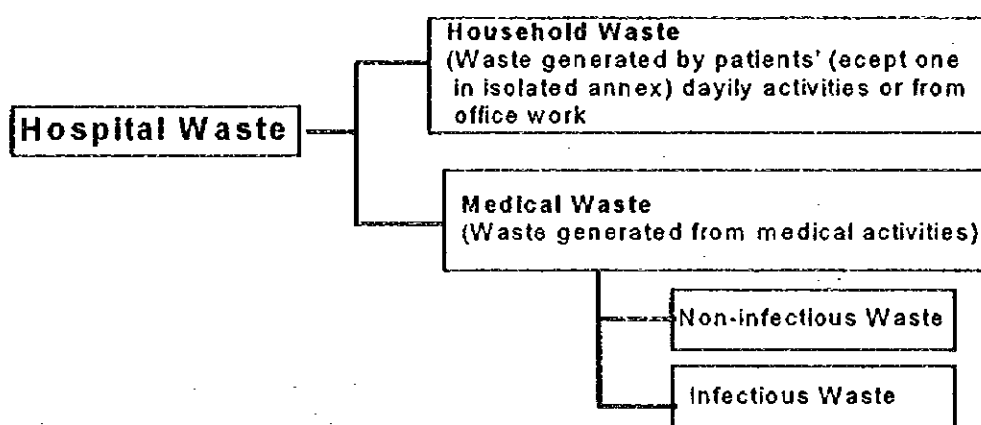


Figure 8.7-1 Types of Hospital Wastes

Infectious waste is categorized as special waste, but it has not yet been legally defined in Morocco. The Ministry of Health, however, has already prepared guidelines for defining the waste. Unless hospital waste is infectious, it can be handled as municipal waste. On the other hand, infectious waste must be sterilized before disposal to avoid secondary infection.

There is only one large general hospital serving as a medical center in Safi in addition to a number of small size clinics. This hospital generates infectious waste but does not conduct separation and special sterilization of the waste. The waste is currently discharged in communal containers and hauled to the municipal disposal site by the commune.

8.7.3 Methods and Targets of Treatment

1) Waste Separated from Communal Collection

Industrial waste that communes should not collect are as follows.

- Waste that cannot be disposed of without treatment at the municipal disposal site
- Non-household types of process waste
- Large quantities of waste

(demolition waste, pottery articles, and process waste)

- Waste that does not suit communal collection (i.e. especially dangerous gas bottles, excessively heavy waste, and scrapped cars)

2) Criteria for Waste that can be Accepted at the Municipal Disposal Site

There are some types of waste that the municipal disposal site should not accept without treatment.

- Special Waste (hazardous waste, as defined by the MoE)
- Waste that is unsuitable for the site's operation (liquid or fluid waste, excessively large amount of waste, and bulky waste)

The municipal disposal site can accept the following waste.

- Waste that can be regarded as municipal waste in terms of its composition
- Special waste that is completely neutralized
- Waste that is not fluid and does not disturb the site's operation
- Stabilized waste that causes no environmental risks and does not disturb the site's operation.

3) Treatment Targets

a. General Industrial Waste

- Waste should be reused or recycled as much as possible.
- Waste plastics should be crushed into pieces of no more than 15 cm in each dimension.
- Sludge should be treated by dewatering so as not to be fluid.
- Combustible waste (except vinyl chloride) should be incinerated at factories, or its generation source, when environmental considerations are not an issue for the surrounding area.
- Other industrial waste and treated waste should be disposed of at a controlled disposal site (which satisfies the MoE's guidelines).

b. Demolition Waste

- Waste should be reused or recycled as much as possible.
- Waste should be crushed into pieces of no more than 15 cm in each dimension.
- Waste should be disposed of at the Urban Community's authorized disposal site.

c. Infectious Waste

- Infectious waste should be completely separated from non-infectious waste. Containers clearly indicating "infectious waste" should be used in waste management.
- Infectious waste should be sterilized.
- Pathogenic waste, in particular, should be incinerated.
- Treated infectious waste should be disposed of at a controlled disposal site.

d. Methods of Treatment

(1) General Industrial Waste

- Waste plastics should be treated with a cutting machine, and sludge with hydroextractors.
- Small incinerators can be used for treating papers, clothes, and combustible plastic waste except vinyl chloride, only when combustion gas has no negative influence on the surrounding living environment.
- Other industrial waste and treated waste should be disposed of at a controlled disposal site. Industrial waste is generated in small quantities in Safi, and there is only a slight possibility that industries or private service providers will establish their own disposal sites. Therefore, the controlled disposal site to be controlled by the Urban Community will have to accept this type of waste.
- Expired canned food is the largest element of the industrial waste generated in Safi. After the BMH's procedures, the waste should be crushed by bulldozers at a controlled disposal site under the supervision of the BMH. The crushed waste should be landfilled, and cover soil must be placed at the end of each day.

(2) Demolition Waste

- Demolition waste should be crushed into pieces of less than 15 cm in each dimension or at the construction sites. The waste should be disposed of at the Urban Community's authorized site.
- Crushed demolition waste can be reused as raw material to pave roads in the Urban Community's controlled site.

(3) Infectious Waste

- Hospitals should introduce their own autoclaves to sterilize infectious waste (except pathogenic waste).
- One option is to locate a small incinerator in large hospitals where a large amount of infectious waste is generated since autoclave treatment in this case will require extra management. Pathogenic waste must be incinerated. Locating a treatment facility in the hospital, however, is not recommended because the hospital is in a residential area.
- It is recommended to locate an incinerator of several hundred kg capacity for an eight hour daily operation in a suburb of Safi. Since an incinerator of such capacity is hard to operate as a private business, the government should provide public general hospitals with instructions for constructing the facility. The Ministry of Health should examine how to secure funds for the facility construction based on its national guidelines for hospital waste.
- Sterilized hospital waste should be disposed of at the Urban Community's controlled site.
- In case sterilization cannot be conducted properly, temporary disposal can be conducted in a controlled disposal site. The temporary disposal spot should be a pit used exclusively for infectious waste. Entrance to the site should be restricted, and cover soil should be applied there at the end of each day.

8.7.4 Methods and Activities of Control

1) Urban Community's Control of Industrial Waste

a. The Urban Community's controlled disposal site should accept non-municipal waste and industrial waste (except demolition waste and pottery articles) on a contract basis. The Community and factories should make contracts for waste disposal as follows:

- The factory should be required to submit an application
- The Urban Community must confirm that hauled-in waste meets the criteria related to make a contract.
- Contracts for disposal should address the following aspects.
 - Types of waste to be disposed of
 - Agreement on criteria for waste
 - Termination of a contract when inspection proves the waste is not suitable, fines, and responsibility to restore damage
 - Payment of tipping fees
 - Presentation of an admission pass, and weighing of waste at the entrance of disposal site
 - Reporting any changes in the type of waste, etc.
 - Payment of contract handling charge
- Contract term one year.

b. The Urban Community should introduce a system for approving disposal of demolition waste and pottery articles under certain conditions. Owners of land where such waste is landfilled must obtain approval for its use as a disposal site.

The following items should be introduced: gates to and walls around the pit, location of water sprinklers, indicating land use as disposal site, presentation of Community's approval (numbers and terms), presenting names of facility manager, etc.

c. Periodical inspection should take of the waste hauled in from factories. Such inspection should be made of the municipal waste collected by communal trucks. Factories should also be instructed to improve their waste management based on the inspection results.

d. It is necessary to regularly monitor the separation and management of infectious waste. Hospitals should be instructed to improve waste management based on the monitoring results.

Legal action such as administrative penalties can be imposed on the factories that do not follow the Community's instructions.

2) Provincial and MoE's Control

In the near future the MoE will set up SWM law and regulations, disposal standards for special waste, and facility standards for landfill and treatment from an environmental point of view.

Also, the ministry will ensure the location of proper facilities by introducing an approval system, through the Community, for intermediate treatment facilities and disposal sites.

It is necessary to impose national and provincial control over special waste. In Safi such control will be placed in hospitals, which generates infectious waste. It is necessary to make institutional arrangements, based on national guidelines, including obligation of hospitals to report to the Province or the BMH. Reports should identify persons in charge of infectious waste management and, periodically, its operation records.

Legal arrangements, however, are not yet developed, and an administrative system for SWM is also not established. For the time being, the MoE and Province should lead a discussion with other authorities on the construction of the disposal site in Safi. Hospitals and treatment facilities for infectious waste should report, as instructed, to authorities on their overall internal arrangements for managing SWM.

CHAPTER 9 PROJECTED EXPENDITURES ON SOLID WASTE MANAGEMENT

9.1 Projected Expenditures for Collection and Transport Improvement

Tables 9.1-1 and 9.1-2 show annual operation and investment costs for the collection and transport improvement plan and the street sweeping plan.

Collection and transport improvement costs will increase annually during the plan period, and respective figures for 2010 compared to those of 1997 for each of Boudheb, Zaouia and Biada will be 1.14, 1.52 and 1.53 times more. However because of the larger amounts of waste to be collected and transported and more efficient collection system applied, unit rates of the three urban communes, expressed in amount of money spent to collect one ton of waste (Dirham/ton) will decrease.

In the street sweeping plan operation and investment costs will increase, but unit costs will remain the same. More strict control of the work will allow longer street lengths to be swept and with higher frequencies.

Operating costs were calculated as follows;

- Salaries
 - Supervisor: 3,000 DH/month (1 supervisor for about 5 trucks)
 - Driver: 2,200 DH/month
 - Collection worker: 1,900 DH/month
- 2 additional crews as stand-by and all salary costs multiplied by a factor of 1.5 to take into consideration insurance, holidays, tax, etc.
- Fuel and lubricants: 10 liters/trip x 10 DH/lit
- Maintenance and repairs: (40% of truck cost)/(truck age)
- Depreciation: (Equipment cost)/(equipment life)
- Indirect costs & misc.: 20% of the above costs
- Unit costs: the above total costs divided by the waste amount collected

Investment costs covered purchase of equipment for renewal. Costs and haulage capacities are shown below;

• Compactor (12m ³)	1,100,000 DH
• Compactor (8 m ³)	850,000 DH
• Dump truck (4 m ³)	540,000 DH
• Pick-up (2m ³)	220,000 DH
• Multi-loader (3 m ³)	500,000 DH
• Communal container (3 m ³)	9,000 DH
• Communal container (0.7 m ³)	4,000 DH
• Communal container (0.4 m ³)	1,800 DH
• Hand-cart	1,000 DH

For the purpose of planning the investment costs assumed ages of 8 years for trucks, 5 years for large containers, and three years for small containers. However during actual operation the life of some trucks may be extended a couple of years, while that of others may be shortened due to accidents, etc. These circumstances may flatten the sharp fluctuations in investment costs.

9.2 Safi Urban Community

Projected expenditure from the year 1997 to 2010, shown in the following Table 9.2-1, is estimated based on the implementation schedule and estimated cost which are described Section 7.7 and 7.8, respectively.

Table 9.2-1 Projected Expenditure 1997 - 2010

(Unit : DH)

Year	Investment Cost			O/M Cost	Total
	Construction	Procurement	Sub Total		
1997	4,852,000	8,800,000	13,652,000		13,652,000
1998				1,511,000	1,511,000
1999	33,857,500	1,800,000	35,657,500	1,511,000	37,168,500
2000				1,511,000	1,511,000
2001				1,145,000	1,145,000
2002				1,145,000	1,145,000
2003				1,145,000	1,145,000
2004		6,000,000	6,000,000	1,145,000	7,145,000
2005		700,000	700,000	1,145,000	1,845,000
2006				1,145,000	1,145,000
2007		1,800,000	1,800,000	1,145,000	2,945,000
2008				1,145,000	1,145,000
2009				1,145,000	1,145,000
2010				1,145,000	1,145,000

Table 9.1-1 Collection and Transport Improvement Plan Operation and Investment Costs

unit	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
A. Boudheh														
(A.1) Operation														
- salaries	1,938,187	2,037,750	1,380,261	1,526,385	1,578,747	1,753,029	1,784,125	1,953,594	1,954,002	2,010,668	2,068,977	2,128,977	2,083,128	2,254,249
- fuel and lubricants	1,884,346	2,014,753	1,454,577	1,648,778	1,705,338	1,861,385	2,045,442	2,239,732	2,214,365	2,278,582	2,344,661	2,412,656	2,360,697	2,554,619
- maintenance and repairs	380,528	400,076	394,910	471,656	487,835	505,745	518,506	567,757	586,443	603,450	620,950	638,958	625,197	676,554
- depreciation	996,394	1,047,578	1,065,606	1,272,467	1,316,118	1,358,248	1,394,779	1,527,264	1,580,778	1,626,620	1,673,792	1,722,332	1,685,240	1,823,676
- indirect & misc. costs	1,039,880	1,100,070	859,038	983,845	1,017,595	1,095,669	1,148,559	1,257,657	1,267,106	1,303,852	1,341,664	1,380,572	1,350,840	1,461,806
- total	6,239,335	6,124,219	4,599,107	4,895,786	5,063,752	5,560,720	5,426,561	5,942,012	6,138,938	6,316,968	6,500,160	6,688,664	6,544,617	7,082,232
(A.2) Equipment purchase	0	0	1,982,000	2,762,000	0	1,422,000	848,000	2,900,000	2,085,000	294,000	1,100,000	3,541,000	834,000	1,620,000
(A.3) Unit cost	295	276	197	202	202	214	201	213	213	213	213	213	202	213
B. Zaouia														
(B.1) Operation														
- salaries	1,492,880	1,629,266	1,553,337	1,591,995	1,664,389	1,664,878	1,530,518	1,266,531	1,420,911	1,492,982	1,568,545	1,589,111	1,652,675	1,718,782
- fuel and lubricants	1,220,223	1,331,700	1,447,890	1,320,893	1,380,959	1,461,536	1,323,616	1,184,894	1,372,148	1,441,746	1,514,716	1,523,173	1,584,100	1,647,464
- maintenance and repairs	214,631	234,240	223,323	228,881	239,289	236,726	295,439	398,364	411,397	432,264	454,141	476,608	495,673	515,500
- depreciation	536,578	585,599	558,308	572,203	598,223	647,169	760,796	1,062,207	1,092,009	1,147,397	1,205,470	1,269,424	1,320,201	1,373,010
- indirect & misc. costs	692,862	756,161	756,572	742,794	776,572	806,062	782,074	782,399	859,293	902,878	948,574	971,663	1,010,530	1,050,951
- total	4,157,174	4,536,965	4,539,430	4,456,767	4,659,433	4,836,370	4,692,442	4,694,395	5,155,758	5,417,267	5,691,447	5,829,981	6,063,180	6,305,707
(B.2) Equipment purchase	0	0	0	0	0	545,000	1,370,400	4,066,800	1,085,000	270,400	536,800	1,071,400	315,400	1,036,800
(B.3) Unit cost	358	358	322	291	291	289	268	257	271	271	271	265	265	265
C. Biada														
(C.1) Operation														
- salaries	1,119,266	1,298,606	1,005,680	945,270	1,016,225	1,031,768	1,112,685	1,062,587	1,138,236	1,193,131	1,251,477	1,276,372	1,354,329	1,435,477
- fuel and lubricants	1,054,761	1,204,284	1,029,016	863,177	927,970	1,014,903	1,094,497	1,005,923	1,077,538	1,129,506	1,184,740	1,277,281	1,355,293	1,436,499
- maintenance and repairs	187,246	212,768	190,274	221,415	238,035	249,539	269,109	295,434	316,467	331,729	347,952	358,683	380,591	403,395
- depreciation	485,020	548,655	496,527	588,399	632,566	664,352	716,454	791,056	847,373	888,241	931,677	961,029	1,019,726	1,080,825
- indirect & misc. costs	569,259	652,863	544,299	523,652	562,959	592,112	638,549	631,000	675,923	708,521	743,169	774,673	821,988	871,239
- total	3,415,552	3,917,175	3,265,796	3,141,913	3,377,755	3,552,675	3,831,294	3,786,001	4,055,537	4,251,128	4,459,015	4,648,038	4,931,926	5,227,434
(C.2) Equipment purchase	0	540,000	1,614,000	1,095,000	0	848,000	785,000	1,394,000	294,000	785,000	1,668,000	1,698,000	245,000	794,000
(C.3) Unit cost	517	486	364	303	303	298	303	279	279	279	279	278	278	278
D. Total Safi City														
(D.1) Operation														
- salaries	4,550,332	4,965,623	3,939,277	4,063,650	4,259,360	4,449,675	4,427,328	4,282,712	4,513,149	4,696,781	4,888,999	4,994,461	5,090,132	5,408,508
- fuel and lubricants	4,159,331	4,550,737	3,931,484	3,832,849	4,014,267	4,337,824	4,463,555	4,430,549	4,664,052	4,849,833	5,044,117	5,213,110	5,300,091	5,638,582
- maintenance and repairs	782,405	847,083	808,507	921,952	965,159	1,012,010	1,083,055	1,261,555	1,314,307	1,367,443	1,423,043	1,474,249	1,501,460	1,595,449
- depreciation	2,017,992	2,181,832	2,120,442	2,433,069	2,546,907	2,669,768	2,872,029	3,380,528	3,520,160	3,662,258	3,810,939	3,952,786	4,025,167	4,277,510
- indirect & misc. costs	2,302,001	2,509,044	2,159,929	2,250,292	2,357,126	2,493,843	2,569,182	2,671,056	2,802,322	2,915,251	3,033,407	3,126,909	3,183,358	3,383,996
- total	13,812,061	14,578,360	12,404,333	12,494,466	13,100,920	13,949,764	13,950,298	14,422,408	15,350,233	15,985,362	16,650,622	17,166,684	17,599,723	18,615,374
(D.2) Equipment purchase	0	540,000	3,596,000	3,857,000	0	2,815,000	3,003,400	8,360,800	3,464,000	1,349,400	3,304,800	6,310,400	1,394,400	1,992,800
(D.3) Unit cost	351	339	267	250	251	255	244	242	246	246	247	244	240	245

Table 9.1-2 Street Sweeping Plan Operation and Investment Costs

unit	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
(A) Boudheh														
(A.1) Operation costs														
- salaries	DH 1,391,616	1,391,616	1,413,360	1,435,104	1,565,568	1,565,568	1,587,312	1,609,056	1,630,800	1,761,264	1,783,008	1,783,008	1,804,752	1,826,496
- hand cart depreciation	DH 41,400	41,400	42,000	42,600	46,200	46,200	46,800	47,400	48,000	51,600	52,200	52,200	52,800	53,400
- hand cart repairs	DH 7,680	7,680	7,800	7,920	8,640	8,640	8,760	8,880	9,000	9,720	9,840	9,840	9,960	10,080
- broom and basket	DH 76,800	76,800	78,000	79,200	86,400	86,400	87,600	88,800	90,000	97,200	98,400	98,400	99,600	100,800
- misc. (10% of above)	DH 151,750	151,750	154,116	156,482	170,681	170,681	173,047	175,414	177,780	191,978	194,345	194,345	196,711	199,078
- total	DH 1,669,246	1,669,246	1,695,276	1,721,306	1,877,489	1,877,489	1,903,519	1,929,550	1,955,580	2,111,762	2,137,793	2,137,793	2,163,823	2,189,854
- unit cost	DH/km 56	56	56	56	56	56	56	56	56	56	56	56	56	56
(A.2) Investment costs														
DH 40,800	40,800	40,800	42,000	42,000	45,600	45,600	46,800	46,800	48,000	51,600	51,600	51,600	52,800	52,800
(B) Zaouia														
(B.1) Operation costs														
- salaries	DH 695,808	717,552	717,552	739,296	1,108,944	1,108,944	1,130,688	1,130,688	1,152,432	1,369,872	1,391,616	1,391,616	1,413,360	1,435,104
- hand cart depreciation	DH 22,200	22,800	22,800	23,400	33,600	33,600	34,200	34,200	34,800	40,800	41,400	41,400	42,000	42,600
- hand cart repairs	DH 3,840	3,960	3,960	4,080	6,120	6,120	6,240	6,240	6,360	7,560	7,680	7,680	7,800	7,920
- broom and basket	DH 38,400	39,600	39,600	40,800	61,200	61,200	62,400	62,400	63,600	75,600	76,800	76,800	78,000	79,200
- misc. (10% of above)	DH 76,025	78,391	78,391	80,758	120,986	120,986	123,353	123,353	125,719	149,383	151,750	151,750	154,116	156,482
- total	DH 836,273	862,303	862,303	888,334	1,330,850	1,330,850	1,356,881	1,356,881	1,382,911	1,643,215	1,669,246	1,669,246	1,695,276	1,721,306
- unit cost	DH/km 56	56	56	56	56	56	56	56	56	56	56	56	56	56
(B.2) Investment costs														
DH 21,600	22,800	22,800	22,800	22,800	33,600	33,600	33,600	33,600	34,800	40,800	40,800	40,800	42,000	42,000
(C) Biada														
(C.1) Operation costs														
- salaries	DH 326,160	326,160	326,160	326,160	369,648	369,648	391,392	391,392	391,392	434,880	456,624	456,624	456,624	478,368
- hand cart depreciation	DH 12,000	12,000	12,000	12,000	13,200	13,200	13,800	13,800	13,800	15,000	15,600	15,600	15,600	16,200
- hand cart repairs	DH 1,800	1,800	1,800	1,800	2,040	2,040	2,160	2,160	2,160	2,400	2,520	2,520	2,520	2,640
- broom and basket	DH 18,000	18,000	18,000	18,000	20,400	20,400	21,600	21,600	21,600	24,000	25,200	25,200	25,200	26,400
- misc. (10% of above)	DH 35,796	35,796	35,796	35,796	40,529	40,529	42,895	42,895	42,895	47,628	49,994	49,994	49,994	52,361
- total	DH 393,756	393,756	393,756	393,756	445,817	445,817	471,847	471,847	471,847	523,908	549,938	549,938	549,938	575,969
- unit cost	DH/km 56	56	56	56	56	56	56	56	56	56	56	56	56	56
(C.2) Investment costs														
DH 12,000	12,000	12,000	12,000	12,000	13,200	13,200	13,200	13,200	13,200	14,400	15,600	15,600	15,600	15,600
(D) Total Safi City														
(D.1) Operation costs														
- salaries	DH 2,413,584	2,435,328	2,457,072	2,500,560	3,044,160	3,044,160	3,109,392	3,131,136	3,174,624	3,566,016	3,631,248	3,631,248	3,674,736	3,739,968
- hand cart depreciation	DH 75,600	76,200	76,800	78,000	93,000	93,000	94,800	95,400	96,600	107,400	109,200	109,200	110,400	112,200
- hand cart repairs	DH 13,320	13,440	13,560	13,800	16,800	16,800	17,160	17,280	17,520	19,680	20,040	20,040	20,280	20,640
- broom and basket	DH 133,200	134,400	135,600	138,000	168,000	168,000	171,600	172,800	175,200	196,800	200,400	200,400	202,800	206,400
- misc. (10% of above)	DH 263,570	265,937	268,303	273,036	332,196	332,196	339,295	341,662	346,394	388,990	396,089	396,089	400,822	407,921
- total	DH 2,899,274	2,925,305	2,951,335	3,003,396	3,654,156	3,654,156	3,732,247	3,758,278	3,810,338	4,278,886	4,356,977	4,356,977	4,409,038	4,487,129
- unit cost	DH/km 56	56	56	56	56	56	56	56	56	56	56	56	56	56
(D.2) Investment costs														
DH 74,400	75,600	76,800	76,800	76,800	92,400	92,400	93,600	93,600	96,000	106,800	108,000	108,000	110,400	110,400

9.3 Financing the Solid Waste Improvement Plan

9.3.1 Projected Costs

The proposed SWM Improvement Plan for the city of Safi is based upon certain underlying assumptions about economic and population growth, and their relationships with the volume of waste generated, i.e:

Population growth:

Boudheb: 1.88% per year

Zaouia: 3.26% per year

Biada: 1.51% per year

Per capita economic growth throughout Safi: 2% per year

Waste generation growth: 0.75% of economic growth rate

Projected costs of SWM necessary to achieve the targeted improvements and extension of service for the three Communes contained in the proposed Improvement Plan for Safi are presented in Tables 9.3-1, 9.3-2 and 9.3-3 below. These show varying rates of increase in annual costs; thus between 1996 and 2010, costs of waste collection and street sweeping are expected to increase by 41% in Boudheb, 118% in Zaouia, and 130% in Biada. However, in reality, costs will increase at a somewhat slower rate; in 1996, a considerable number of low income workers were paid by the national government in the national employment promotion scheme; after 1996 our projections assume that these costs are borne by the Communes. Using 1997 as the base year, therefore, the total annual increase by the year 2010 becomes only 17% for Boudheb, 61% for Zaouia, and 52% for Biada.

Table 9.3-1 Boudheb: Projected Costs of Waste Collection and Street Sweeping, 1996-2010

Unit: Thousand DH

Year	Collection: Operating Expenses	Collection: Depreciation	Sweeping: Operating Expenses	Sweeping: Depreciation	Total
1996	3,859	1,032	1,696	0	6,587
1997	5,243	996	1,628	41	7,908
1998	5,077	1,048	1,628	41	7,794
1999	3,533	1,066	1,653	42	6,294
2000	3,623	1,272	1,679	43	6,617
2005	4,558	1,581	1,908	48	8,095
2010	5,258	1,824	2,136	53	9,271

Table 9.3-2 Zaouia: Projected Costs of Waste Collection and Street Sweeping, 1996-2010

Unit:

Thousand DH

Year	Collection: Operating Expenses	Collection: Depreciation	Sweeping: Operating Expenses	Sweeping: Depreciation	Total
1996	2,885	675	129	0	3,689
1997	3,621	537	814	22	4,994
1998	3,951	586	839	23	5,399
1999	3,981	558	839	23	5,401
2000	3,885	572	865	23	5,345
2005	4,064	1,092	1,348	35	6,539
2010	4,933	1,373	1,679	43	8,026

Table 9.3-3 Biada: Projected Costs of Waste Collection and Street Sweeping, 1996-2010

Unit:

Thousand DH

Year	Collection: Operating Expenses	Collection: Depreciation	Sweeping: Operating Expenses	Sweeping: Depreciation	Total
1996	1,774	404	350	0	2,528
1997	2,931	485	382	12	3,809
1998	3,368	549	382	12	4,311
1999	2,769	496	382	12	3,660
2000	2,553	588	382	12	3,536
2005	3,208	847	458	14	4,527
2010	4,147	1,081	560	16	5,803

In contrast to the foregoing, solid waste disposal, the responsibility of the Urban Community of Safi, is expected to become increasingly important, as reflected in the projected expenditures over the period, which are shown in Table 9.3-4. Compared with the collection and street sweeping activities of the Communes, the rate of increase in required expenditures is considerable, the annual costs incurred by the year 2010 being about 11 times as great as those currently incurred.

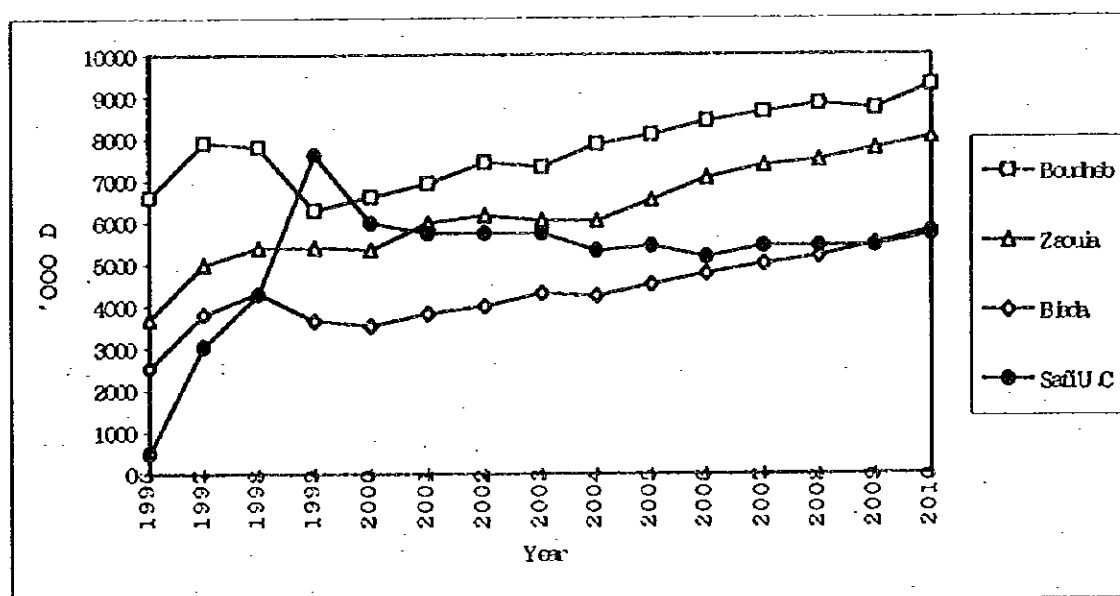
Table 9.3-4 U.C. Safi: Projected Costs of Solid Waste Disposal, 1996-2010

Unit: Thousand DH

Year	Operating Expenses	Depreciation	Total
1996	165	329	493
1997	165	2,874	3,039
1998	1,404	2,874	4,279
1999	1,404	6,210	7,614
2000	1,404	4,592	5,996
2005	1,145	4,292	5,437
2010	1,145	4,549	5,694

A comparison of the rates of increase in the cost of SWM is presented in Figure 9.3-1 below, which illustrates the financial implications of the need to make up for the backlog in waste disposal capacity, as compared with waste collection and street sweeping services.

Figure 9.3-1 Projected Costs of SWM in Safi: 1996-2010



9.3.2 Affordability of the Improvement Plan

Some indication of the affordability, or financial feasibility, of the projected cost requirements described above can be assessed in terms of their relationship with existing and projected local government expenditures, not only on SWM itself, but in total, since SWM expenditures are committed out of general revenues. These relationships are summarized in Table 9.3-5 below. However, all financing options are dependent upon the overall financial situation and policies of the local government concerned; thus implicitly any policy recommendation made here assumes "business as usual" for other local government activities and financing. For example, the relatively low percentage of total revenues required for SWM in Zaouia does not necessarily mean that the targeted improvements are more affordable than they are in Boudheb or Biada. Ultimately, affordability also depends upon the magnitude of liabilities faced by the Commune in addition to those relating to SWM, but this requires analysis of overall revenues and expenditures of the local governments involved, which lies outside the terms of reference of the present study.

**Table 9.3-5 Projected SWM Costs as Percentage of
Local Government Revenues: 1996-2010**

Year	Boudheb	Zaouia	Biada	UC Safi
1996	22	10	15	1
1997	26	13	22	9
1998	25	14	24	12
1999	19	13	20	20
2000	19	12	18	15
2005	20	12	20	11
2010	19	11	21	9

The above table does however show that while there are significant differences between the three Communes in terms of the proportion of local government revenues devoted to SWM, the actual percentage remains fairly constant (after 1996) over the lifetime of the Improvement Plan. The implication of this is that the program proposed by the JICA study team should not in itself place an undue burden on the three Communes, so in that sense it is "affordable". Since the volume of waste generated, and thus the cost of SWM, is primarily dependent upon economic growth rates, consistent improvement in standards of service is, by definition, quite feasible from a financial point of view, assuming that local government financial capacity and other commitments grows at roughly the same rate as the economy as a whole. SWM costs only create an major additional burden when substantial improvement in quality of service, or extension of service is involved. In the case of Safi this applies primarily to the need to manage waste disposal by introducing a sanitary landfill site for the Urban Community.

9.3.3 Capital Expenditures for the Improvement Plan

Table 9.3-6 shows required expenditure on civil works and equipment at the time of actual construction or procurement over the period 1997-2010. It was noted above that total costs for the three Communes (including provision for depreciation) shows a relatively slow rate of increase over the period, and in fact in remain roughly constant as a percentage of projected total local government revenues. Solid waste collection and street sweeping activities carried out by the Communes are not highly capital-intensive, and it will thus often be possible for them to finance capital investment in trucks, carts and containers out of current revenues, without having to borrow from FEC or some other source.

There are however immediate problems of finding adequate funds for investment purposes, notably for the purchase of trucks for Biada, although on an annualized basis the required expenditure still represents a fairly small proportion of total expenditures on SWM. Indeed, this situation illustrates the importance of reforming accounting systems so that funds for depreciation are established, to avoid just such problems as these. The penalty that Biada might have to pay in this case for failing to anticipate such investment requirements is to be forced to borrow from FEC at relatively high interest rates. Other interim measures that might be considered include leasing of collection vehicles; this might be arranged with a neighboring Commune if, for example, truck capacity is underutilized during the night time.

Table 9.3-6 Safi: Capital Expenditures on Solid Waste 1997-2010

Unit: Thousand DH

Year	Boudheb (eqpt.)	Zaouia (eqpt)	Biada (eqpt)	UC Safi (eqpt)	UC Safi (constr)	Total
1997				8,800	4,852	13,652
1998			540			540
1999	1,982		1,614	1,800	33,858	39,254
2000	2,762		1,095			3,857
2001						
2002	1,422	545	848			2,815
2003	848	1,370	785			3,003
2004	2,900	4,067	1,394	6,000		14,361
2005	2,085	1,085	294	700		4,164
2006	294	270	785			1,349
2007	1,100	537	1,668	1,800		5,105
2008	3,541	1,071	1,698			6,310
2009	834	315	245			1,394
2010	162	1,037	794	1,800	33,858	37,651

Note: Rehabilitation and minor construction and extension of buildings is included in annual operating expenses.

With regard to financing of waste disposal, investment funds are the dominant concern, since the new sanitary landfill will involve substantial capital expenditures. The financial impact of the proposed landfill for Safi Urban Community as a whole is considerable, as demonstrated in Table 9.3-5, which shows dramatic increases in required solid waste expenditures, rising from 1 percent to a peak of 20 percent of the annual revenues received by the Urban Community. To the extent that the landfill is used by industry, full cost recovery by tipping fees or other method should be used, thus reducing net operating costs; however, it is estimated that this will be a relatively small amount for the foreseeable future. (It is not recommended, certainly at the present level of organization and accounting, that the Communes should pay tipping fees).

The source of financing used for the new landfill will obviously determine the future cost structure; if grant money, perhaps from the national government, Japan, or some other source, is available, the costs of waste disposal can be approximated on a year-by-year basis by depreciating the landfill over its useful life (assumed to be 11 years). If on the other hand, it is necessary to borrow from the FEC, annual amortization costs must be added to operating expenses. In either case, financial planning should prepare for the time at which the capacity of the new landfill is exhausted and additional capacity must be introduced.

9.3.4 Conclusion

With respect to the waste collection and street sweeping functions of the Communes, achievement of the Improvement Plan should not, in the long run, place an undue burden on the local finances. This suggests that a more ambitious plan may be considered, depending upon the success in implementing the necessary accounting, organizational, and other reforms to improve the efficiency of SWM operations. However, it is important to re-emphasize that affordability of the SWM improvement Program cannot be determined in isolation from the overall revenues and obligations of the local government entity concerned.

There does not therefore appear to be a strong case for specific intervention from the central government in terms of financial assistance to the Communes for their SWM functions. However, as noted in the Guidelines for National Level Policies and Actions for Solid Waste management (Book 1-Part 2), the national government does have a general responsibility for measures designed to reduce solid waste problems faced by local governments, such as the introduction of environmental taxes or deposit-refund schemes as well as a range of non-financial measures.

One area in which specific subsidy from the national government may be justified, and not in conflict with the principle of decentralization, is with regard to the sanitary landfill site. Design and operation of this site, which is located outside of Safi itself, should take account of the actual and potential impact of the waste disposal facility on the welfare of populations in other communities. Details will need to be assessed in the feasibility study of the landfill site, which should consider the case for national level subsidy to ensure that inter-jurisdictional interests are protected.

**PART B PUBLIC WASTE EDUCATION
DEMONSTRATION PROJECT IN SAFI**

CHAPTER 1**GENERAL PRESENTATION OF THE PROJECT****1.1 Context and Objectives of the Project****1.1.1 Role of Public Education**

The role of public education consists in adjusting and people's mentality and behavior to the evolution of the problems raised by the waste that society generates. The quality of waste management is not dependent only on the technology of collection. It can also depend largely on people's attitudes that can be either indifferent (by trying to get rid of waste and, therefore, think of one's comfort only without getting worried about the possible nuisances in public space), positive (by managing one's waste along the way that extends from dustbin to collection by public services), or completely negative (by allowing oneself to dump waste according to one's desire basing oneself on the idea that it is solely a matter for the government to handle).

By increasing public awareness, we provide the means to act on residents' mentality and attitudes in order to improve the technical (efficiency), political (acceptability) and environmental (hygiene, quality of urban environment) aspects of the management of waste. For instance, the illegal disposal of waste leads to "black points" and renders waste collection according to acceptable hygiene norms very difficult. Moreover, the introduction of a technical change in the system of collection with the aim to improve its performance can result in the unexpected if it is wrongly accepted or misunderstood by the population.

The increase of public awareness in the domain of SWM should contribute to the achievement of 3 main categories of objectives, namely:

- The improvement of SWM, especially for the collection service;
- The alleviation of pressure on environment;
- Better communication between communes and residents.

1.1.2 Usefulness of the Project**1) Results Expected From the Project**

The public education purpose can be implemented through a awareness campaign, an educational program, a project of communication or other types of projects. An awareness campaign has been adopted as a demonstration project for public education in Safi.

We can expect from the awareness project two types of results:

- The demonstration project is part of the project of the national guidelines of SWM and its results should provide conclusions on the Ministry of Environment's behalf.
- The program of the increase of public awareness as such is addressed to residents and it is organized by the Urban Community in cooperation with all the other local authorities.

The national guidelines that have been drawn up to increase the public awareness, show that creation of an awareness of the urgency of the problems relative to solid waste and to the establishment of better communication between communes and residents should be a priority. The demonstration project has thus as a principal objective the planning and the execution of an awareness campaign that is capable of initiating the development of better awareness and communication in the domain of domestic waste.

2) Technical Objectives of Demonstration Project

The usefulness of the public demonstration project is to improve the guidelines or to better identify the national guidelines of SWM in the domain of the increase of awareness and education of the public. This result derives from the success and problems faced and from their evaluation. At this level, the lessons that can be drawn from the experience obtained in Safi are more important than the nature of the results themselves. Within the framework of study, the public demonstration project constitutes an experiment intended to verify the importance of the guidelines and, consequently, to reformulate these guidelines.

The usefulness of the project consists in:

- Making the local communes take part in the achievement of the different stages of the planning, execution and evaluation of the project to increase public awareness;
- Serving as an example for other communes of Morocco so as to launch their programs of education within the framework of SWM;
- Serving as a pilot project for the study of the national guidelines concerning public education of the Ministry of Environment.

These technical objectives of the project are different from the objective of the increase of awareness as, for instance, the improvement of communication or the participation of the public. They are objectives of quality:

- Better use of the available resources;
- Relevant choice of awareness objectives;
- Quality and effectiveness of organization and actions;
- Quality and effectiveness of communication means;
- Continuity of actions.

3) Objectives of Public Awareness Campaign

The second level of the usefulness of the project is determined with respect to the nature of the awareness campaign results, namely its success or failure. It is especially this level of usefulness which concerns the city of Safi since it has to do with better achievement of its objectives.

Thus, this concerns a program with the general objectives of increasing public awareness and creating conditions that are more targeted and that can accompany the implementation of a SWM plan. Later campaigns to increase awareness should profit from the approach adopted in the demonstration project. At the level of public education, the awareness program should have the following advantages:

- To favor and encourage the continuity of a basic program of public education by taking into consideration the teachings of the campaign;
- To increase the receptivity of the population to the behaviour messages that are broadcast during the campaigns most aimed at in their objectives;
- To increase the popular acceptability of the initiatives that are taken in terms of SWM.

The objectives of the program to increase public awareness are the following:

- To increase the level of awareness of the municipal actors and public with respect to the problems of waste;
- To increase the communities' participation in looking for the necessary dialogue for the evaluation and understanding of waste problems;
- To increase the direct participation of residents by changing attitudes toward waste.

1.2 Public Awareness Activities

1.2.1 Preparation of Educational Materials

A certain number of educational materials for awareness that are adapted to the local conditions and objectives have been prepared for the first time. We should distinguish 3 sets of materials:

- The video cassette, which is a medium of communication intended for national broadcasting, under the responsibility of the Ministry of Environment. The preparation of the video cassette constitutes a project that is independent of the demonstration project. However, its use has been programmed as one of the essential elements to increase public awareness, the personnel of the communes, and of the children of Safi, before any broadcasting at the national level.
- The materials to increase general public awareness, which are prepared by the local authorities for the specific needs of the campaign of Safi. The materials are the following: the sets of posters, the postcard, and the folder.
- Students notebook intended to be used in schools.

1.2.2 Awareness Targets and Means

The targets and means of awareness that have been taken into consideration for the accomplishment of the objectives of the project are presented here in the form of a list:

1) Municipal Actors' Awareness

- Increase of the awareness of town councilors;
- Increase of the awareness of municipal engineers and technicians;
- Increase of the awareness of waste collectors;
- Ceremony of the campaign's opening;
- Video showing;
- Participation in the preparation of the campaign.

2) Public Awareness

- Increase of awareness of the general public;
- Setting up of giant posters and distribution of the campaign materials (folder, postcard);
- Presentation and promotion of the video film prepared by the Ministry of Environment in cooperation with JICA;
- Itinerant exhibition of the Ministry of Environment in association with the exhibition of the drawings of the participants in the drawings competition;
- Campaign launching ceremony.

3) Awareness at Schools

- Increase of the awareness of students in the 5th to 7th classes;
- Launching of awareness at secondary schools;
- Increase of awareness of coordinators and teachers;
- School visits by the operators of municipal waste;
- Students' drawing competition and prize giving;
- Distribution and use of educational materials (students' notebook);
- Video showing;
- Participation in the campaign's opening ceremony.

1.2.3 Other Activities

The execution of the program comprises other activities such as the launching ceremony, the itinerant exhibition of the Ministry of Environment, the organization for the setting up of posters, the giving of materials, the showing of video film, and the evaluation of activities. The evaluation of results is the last stage of the program. All these aspects are described in the appendix of the report.

1.3 Educational Media and the Increase of Awareness

The principal media of awareness that have been used for the accomplishment of the objectives of the campaign are summarized in this section. A detailed description is presented in the appendix of the report.

1.3.1 Video Film for General Public Use

This film is aimed at the general public and possibly secondary school students. It is a pedagogical documentary on the problems of SWM, especially the sanitary and environmental aspects. It ends with some general and concrete recommendations concerning the attitudes that residents should have with regard to waste. The time of the film is about 20 minutes.

1.3.2 Video Film for Communes' Use

This film is aimed at municipal actors, namely engineers, or technicians, and the elected representatives. It can also concern school teachers for a more complete information. This film is to some extent more technical than the previous one insofar as it presents recommendations relating to waste disposal in a pedagogical way. Time of this film is 20 minutes.

1.3.3 Giant Posters

The giant posters project is comprised of a series of stages among which the most important are the competition and the selection of drawings, the mounting of posters, the accomplishment of the project and the setting up of display boards, and finally the display. The project was carried out between November 1996 to February 1997.

The giant posters (2m x 2,5m) are produced in small numbers and set up in well selected sites. The objective of these posters is to hold the attention of the public and to influence as much as possible public opinion. Factors determining the impact of posters on opinion are:

- Size;
- Location;
- Aesthetics and quality;
- Language of the picture;
- Time of display;
- The composition of 3 complementary series which is a source of reflection.

The cost of the project of giant posters has been about 75% of the total cost of the campaign. It is worth noting here that the video is not part of the cost. Due to the higher cost of printing of posters with this dimension, the estimated cost is DH 8,000 to DH10,000 per poster for this type of project as a total (boards, competition, printing).

1.3.4 Standard Posters

The standard posters have been published in two complementary series and they have the following characteristics:

- Indoor display preferably;
- Geographical coverage that is more extended than that of the giant posters;
- Language that is more "intellectual" than that of the giant posters, but with similar messages.

1.3.5 Student's Notebook

The student's notebook is used for academic purposes and it has an illustrated and printed cover that serves as a medium of communication. This notebook has a double role:

- To serve as a means to increase awareness, combined with promotion by the teacher who devotes some teaching time to the subject of SWM;
- To serve as a medium of information for families through children.

1.3.6 Postcard

The postcard has the picture as its most important means of expression. It shows a strong message of awareness. It constitutes an interesting medium thanks to the following reasons:

- As an artistic picture, it holds the attention and ensures a certain durability;
- It can serve as a wall decoration in children's rooms or as a way to exchange letters and to diffuse the message;
- Its real function is communication by mail; the postcard has in itself the idea that the message should circulate and concern every body.

1.3.7 Folder

The folder is aimed at well-read population of Safi and it presents itself as a tool of information about SWM from communes to residents. The presentation of the folder has been the object of special care in its preparation.

1.4 Implementation of Awareness Campaign

1.4.1 Organization

1) List of Intervening Parties

The permanent intervening parties, who have been mobilized for the accomplishment of the project, are the following:

- The Province;
- Safi Urban Community;
- The 3 Urban Communes of Boudheb, Zaouia and Biada;
- Provincial Delegation of National Education;
- Provincial Delegation of Public Health
- Provincial Delegation of Youth and Sports
- Provincial Delegation of Cultural Affairs
- Culture and Leisure Association (ACL)
- Environment and Development Association

2) Organization of Activities

The intervening parties in the project have participated in one or many of the following activities: the planning of the program, the preparation of educational materials, and the execution of activities. Fig. 1.4-1 shows the work organization for the preparation and the execution of the program. Responsibility for various tasks has been as follows:

- The Urban Community of Safi is the organizer of the campaign. It is supported by the Province, on the one hand, and by JICA Study Team, on the other, in the activities of planning and coordination;
- The Communes are the principal actors in executing the campaign, but they are supported in this task by the provincial delegations and associations;

- The provincial delegations and associations participate in the planning and decision making and they bring their respective competencies for the execution of the plan;
- The Delegation of National Education manages more directly the whole of the awareness activities in schools.

3) Committee of Planning and Evaluation

A permanent committee of planning and evaluation has had regular meetings, once per week. The committee has been comprised of the following components:

- The Urban Community represented by an architect;
- The Communes represented by engineers and technicians who take charge of the problems of SWM among other technical activities;
- The Provincial Delegation of National Education represented by the Office of Socio-Pedagogical, Cultural and Educational Activities.
- The Provincial Delegation of Youth and Sports represented by the regional official who is responsible for Youth Service;
- The Provincial Delegation of Public Health represented by a medical assistant of the Environmental Hygiene Service;
- The Provincial Delegation of National Mutual Aid represented by the person responsible for the Islamic Charitable Associations;
- The Provincial Delegations of Cultural Affairs represented by the delegate;
- The Province represented by the director of Civil Security and Environment;
- The Culture and Leisure Association (ACL) represented by the person responsible for it;
- The Environment and Development Association of Safi represented by the person responsible for it.

1.4.2 Launching of the Campaign

1) The Campaign Launching Ceremony

The ceremony of launching the campaign was planned for February 27th for the last time, before being finally postponed. The ceremony should take place under the presidency of the Governor and in the presence of the Minister of Environment, the First Khalifat, the Presidents of the Urban Community and the Urban Communes of Safi. The ceremony will symbolize the launching of the display, the showing of the video, the itinerant exhibition and the distribution of the awareness materials.

The activities of the ceremony should include:

- Important men's speeches;
- The symbolic display of 3 giant posters side by side, every poster representing a series;
- The prize giving to artists and children;
- The opening and the visit of the itinerant exhibition;
- The video showing;
- The distribution of the educational materials.

2) Itinerant Exhibition of the Ministry of Environment

The itinerant exhibition of the Ministry of Environment is a display on the urban environment and especially on the matter of household waste. This display is set up by the Ministry of Environment at the request of the local communities. In Safi, this display should serve as a framework for the complementary activities, namely the display of the students' drawings and the showing of the video cassette. The opening of the display has postponed.

1.4.3 Schedule of the Program

The time of project is extended from November 1996 to March 1997 according to the following stages:

- Planning of the project and the preparation of awareness and education materials from November 1996 to January 1997;
- Finalization of the schedule of execution in January / February 1997;
- Execution of the program starting from February 1997.

The JICA Study Team has been informed on March 27th, 1997, that the execution of the program, and more specifically the display of the giant posters, had not yet been launched.

The preparation of the video cassette has been realized between August 1996 and January 1997.

The detailed schedule of the activities of planning and execution of the program will be presented in appendix of the final report.

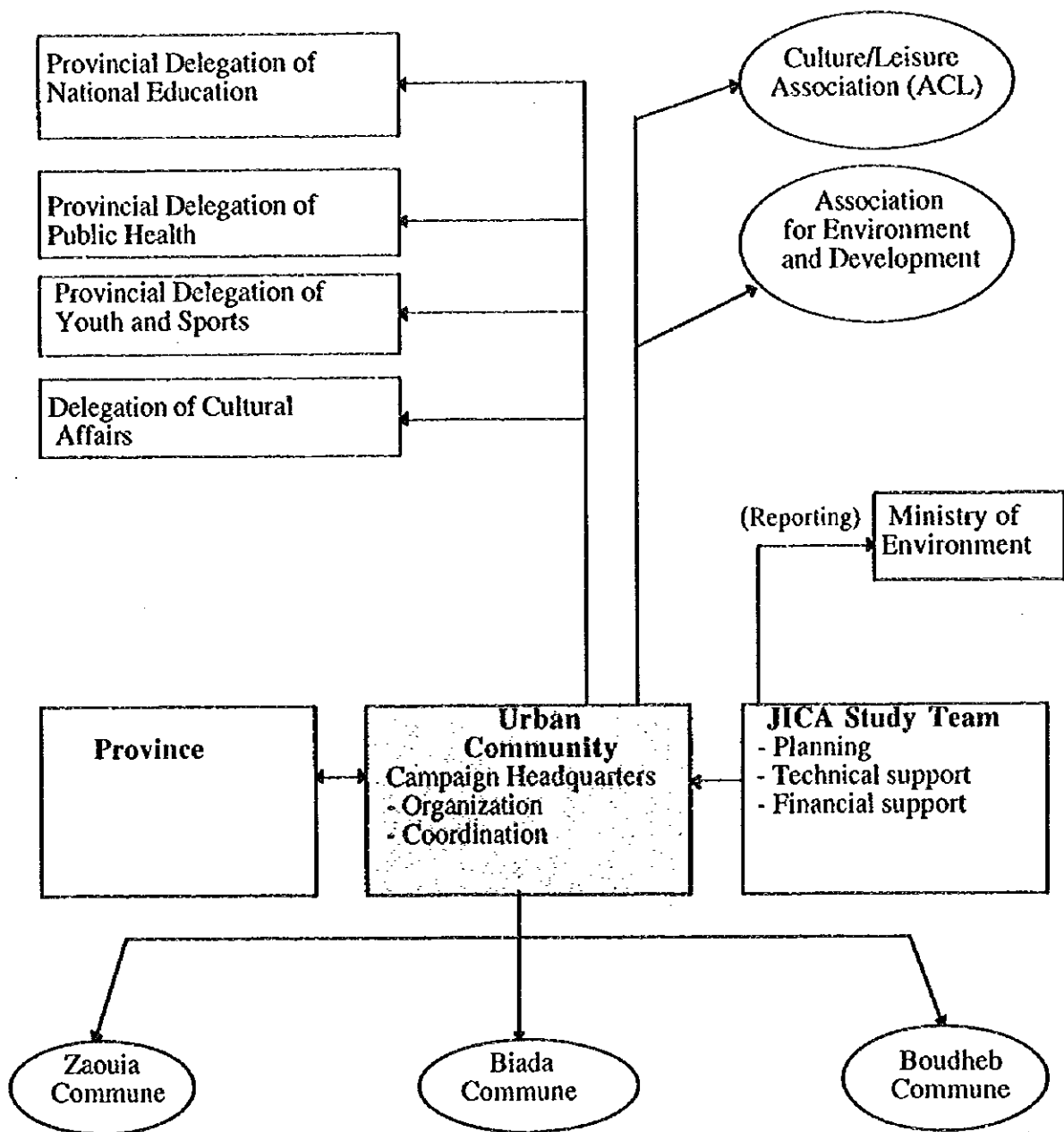


Figure 1.4-1 **Diagram Showing the General Organization of the Program of Education and Awareness Heightening**



CHAPTER 2 CONCEPT AND PRINCIPLES OF THE PROJECT

2.1 Summary

The summary of the public education project can be presented in two different ways. The first type of presentation is a global summary showing the ideas and principles that have been used to conceive and structure the program to increase public awareness. This presentation gives a "transversal" view of the project and it is that which is adopted in here.

The second type of presentation is a thematic summary in the form of a report on activities. The thematic summary describes the major axes of the program, namely the activities or media of communication, from the stage of planning to that of execution. The thematic presentation constitutes the object of a separate report in the appendix. Reference should be made to this appendix in order to understand the details of the project.

The evaluation is not dealt with in the present part. It is presented in the following part.

2.2 Seeking Local Consensus

The decisions regarding the plan of actions and the preparation of educational materials have been made together with the greatest possible number of intervening parties, as has been shown in section 1.4.

2.3 Use of Local Resources

The conception of awareness materials has been developed by calling upon local resources, whether these concern artistic know-how or professional experience. The delegations and associations have brought their expertise in the domain of awareness creation. The artists, most of whom are plastic art teachers, have made possible the conception of the drawings of posters and of the mascot. Students have also contributed to the preparation of the notebook and the postcard. A calligrapher has also taken care of the text of the folder.

The use of local resources allows us to better establish the project, facilitate its local appropriation and give it specificity and cultural identity. Other advantages are quality, creativity and the greatest local contribution.

2.4 Characteristics of Target Groups

The targets aimed at by the project are the municipal actors, children and the general public. The rate of illiteracy in Safi is high. The means of awareness have thus taken into consideration this diversity of targets by the nature of the messages represented and by the functional comple

mentaries of the means themselves. Complementarity between messages and means is explained in Table 2.4-1 and Table 2.4-2.

These tables show, for instance, that pieces of advice such as "close the dustbin properly" constitute a function of messages that has been used only for the educational notebook and the video. The residents have already become used to receiving such recommendations and they are not sufficiently receptive to this type of awareness as long as communication remains insufficient, which is still the case of Safi. On the other hand, such recommendations have been significantly within the reach of their children and even of adults through their children, hence their importance in the educational notebook.

The preponderant role of pictures in materials is also underlined in these tables. It is particularly the case of the giant posters, which offer the pedestrians a reflection dynamics allowing them to look for analogies and relations between the three different poster designs that are set up on different sites.

Table 2.4-1 Characterization of the Different Media of Communication According to Modes of Expression

	Giant Poster	Standard Poster	Folder	Postcard	Student's Notebook	Video
Picture	x	x	x	x		x
Calligraphy			x			
Mascot Technique	x	x	x	x	x	
Slogans and Verses	x	x	x		x	
Textual Description			x		x	x
Numbers; Glossary			x		x	x

Table 2.4-2 Characterization of the Different Media of Communication According to the Principal Functions of Messages

	Giant Posters	Standard Poster	Folder	Postcard	Student's Notebook	Video
Inform			x		x	x
Lead to thinking	x	x	x	x	x	x
Lead to interaction and communication	x		x	x	x	x
Affect attitude and mentality in general	x	x	x	x	x	x
Recommend precise actions					x	x

2.5 Originality of Educational Materials

The objectives of the media are to attract attention, on the one hand, and to achieve maximum durability, on the other. As a result, we notice the following characteristics of the set of materials.

- Giant posters are set up on strategic sites, with 3 different designs;
- Standard posters that are adapted to inside space, with 2 different designs;
- Materials presenting a series of specific objectives and advantages, described in detail further on (postcard, folder, educational notebook).

2.6 Personalizing the Messages

Personalizing the messages is also a factor contributing to the improvement of the impact on communication targets. The main focus of personalizing the messages has been the creation of the Safi "cleanliness" mascot, which is presented here.

2.6.1 Usefulness of the Mascot

The awareness campaign has been the opportunity to create the mascot of Safi. The functions expected from such a character are many:

- To link the different media;
- To personalize messages;
- To reinforce the value of messages for the resident can identify himself with this character;
- To reinforce communication between the resident and his city;
- To favor the continuity of awareness actions for the character is here and it should survive in order to justify the value of messages.

The drawing of the mascot is presented in the form of a logo accompanied by its message which summarizes a philosophy, attitude, and an ethic. It accompanies the different media of communication that are created within the program framework.

2.6.2 Creation of the Mascot

The drawing of the mascot constituted part of the drawing competition launched for the accomplishment of posters. The competition is described in the appendix of the report.

The accompanying message of the mascot has been drawn up by coordination within the jury of selection of the drawings which met on December 1996. The message is as follows: "Me, I contribute to the cleanliness of my city!... What about you?". This mascot, inseparable from its message, has been integrated into every one of the media developed to increase awareness.

2.6.3 Description of the Mascot

The mascot constitutes the personification of a sardine that is identified with a housekeeper. She is putting on a Moroccan headscarf and wearing Turkish slippers with a brush in hand. By raising her hand, she points out her unvarying message.

Some details are added to the feeling of cleanliness and render the character in a good position to teach lessons on cleanliness: the slippery and glittering aspect, the water puddle at the character's feet

The choice of this mascot is interesting because it has the following characteristics:

- Connection with sea (concerns local sensibility);
- Symbol of the activity of Safi (sardine fishing);
- Symbolic of water protection from pollution and by extension, the protection of the quality of the urban environment of Safi.

2.7 Measures for the Continuity of Actions

Ensuring the continuity of the actions of awareness is surely one of the major problems faced by communes. The action plan that has been drawn up in Safi should favour the continuity of actions in many ways:

- In the choice of the nature of awareness;
- In the analysis and consideration of the problems of organization;
- In a certain number of mechanisms that favor continuity.

The nature of awareness is an essential condition of continuity. A major problem of regular cleanliness campaigns seems to be the lack of communication. Continuity becomes possible only from the moment when communication dynamics are created between residents and communes. Here, it concerns the principal objective of the program of Safi. The bases for such dynamics are provided by the broadcasting of reflection messages, the broadcasting of information that serves as a basis for the analysis of reflection and by direct dialogue through video showing. Education at school is a necessary relay to ensure long-term continuity.

Investigation of the problems faced at the level of the campaign organization and the consideration of results in order to improve the mechanisms are obviously essential conditions for continuity. The improvement of the mechanisms of organization and coordination for the accomplishment of campaigns is the principal element at stake. The problem of ensuring the continuity of awareness actions is therefore related to the objective of the finalization of the national guidelines.

The mechanisms that favor the continuity of actions and which have been used within the framework of the action plan of Safi's campaign are, for example, the following:

- The creation of Safi "cleanliness" mascot;
- The creation of a follow-up section;
- The starting of residents' information activities;
- The launching of the awareness project in secondary schools by the Delegation of National Education.