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# Seminar on the Privatization of Solid Waste Services

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Rabat, Morocco  
February 13-14, 1992

Organized by:

Moroccan Ministry of Interior,  
General Directorate for Local Government  
U.S. Agency for International Development  
ICMA (International City/County Management Association)



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# PROGRAM

Thursday, February 13

9:00 - 11:00

## **The Privatization of Municipal Services** "Recent developments and perspectives"

Speakers:

- *Welcome and introduction by the Minister of the Interior or his representative*
- *Opening remarks by the Minister of Economic Affairs and Privatization*
- *Opening remarks by the USAID representative*

11:00 - 11:30

## **Coffee break**

11:30 - 12:30

## **The Collection and Treatment of Solid Wastes in Moroccan Cities**

"General Overview and Specific Problems in Morocco"

Moderator:

- *Mr. Driss Toulali, Director General of Local Government*

Speakers:

(Representative of Department of Local Government)

- *Mr. Ahmed Chouqui Bennani, Director of Planning and Equipment*

12:30 - 2:00

## **Lunch**

2:00 - 3:30

## **Privatization of Solid Waste Collection**

"Economic and financial aspects"

"Technical and institutional aspects"

"Collection of household waste in Casablanca"

Moderator:

- *Mr. Jacques Perreault*

Speakers:

- *Introduction by J. Perreault, Technical Consultant*
- *President of the Municipality of Sidi Belyout - Mr. Ahmed Laski*
- *President of the Municipality of Yacoub El Mansour - Mr. Balafrej*
- *Mr. Cudillon (France)*

- 3:30 - 4:00                   **Coffee break**
- 4:00 - 5:30                   **Methods of Privatizing Solid Waste Services**  
 "Feasability studies"  
 "Appropriate legal forms and methods of payment"  
 "Contract monitoring and mutual obligations"  
 "Issuing requests for proposals and analysis of submissions"
- Moderator:  
 • *M. Jacques Perreault*
- Speakers:  
 • *Mr. R.G. Donovan, Director of Solid Waste Services for the city of Phoenix, USA.*  
 • *Mr. Frank Ohnesorgen, Urban Affairs Advisor, ICMA, USA.*  
 • *Mr. Ahmed Agzoul., President of the Municipality of Tétouan.*

**Friday, February 14**

- 9:00 - 10:30               **Methods of Regulating and Controlling Private Provision of Solid Waste Collection**
- Moderator:  
 • *Mr. Mohamed Fouad Djerrari.*
- Speakers:  
 • *Mr. R.G. Donovan, Director of Solid Waste Services for the city of Phoenix, USA.*
- 10:30 - 11:00              **Coffee break**
- 11:00 - 1:00               **Private Sector Approach to the Collection and Treatment of Solid Waste**  
 "Private sector perspectives"  
 "Project study for the city of El Jadida"
- Moderator:  
 • *Mr. Mohamed Fouad Djerrari.*
- Speakers:  
 • *Mr. Carlos Bejumea, President BFI, Spain*  
 • *Mr. William Rodgers, Vice-President of Chambers Developpt. Inc.*  
 • *Mr. Tahar Masmoudi, President of the Municipality of El Jadida.*  
 • *Mr. René De Larue, Representative of the Groupe Deltri Ltée.*

1:00 - 2:00

**Lunch**

2:00 - 3:30

**The Moroccan Experience in the Privatization of  
Municipal Services**  
"Urban Transportation Case Study"

Moderators:

- *Mr. Jacques Perreault*
- *Mr. Ahmed Chouqui Bennani*

Speakers:

- *Mr. Y. Tahiri, Moroccan Private Transporter*
- *Mr. Lahssen Hirouf Casablanca Urban Community Council*

3:30 - 4:00

**Coffee break**

4:00 - 5:30

**Discussions Following Presentations and Closing  
Remarks**

Moderator:

- *Mr. Ahmed Chouqui Bennani*

Speakers:

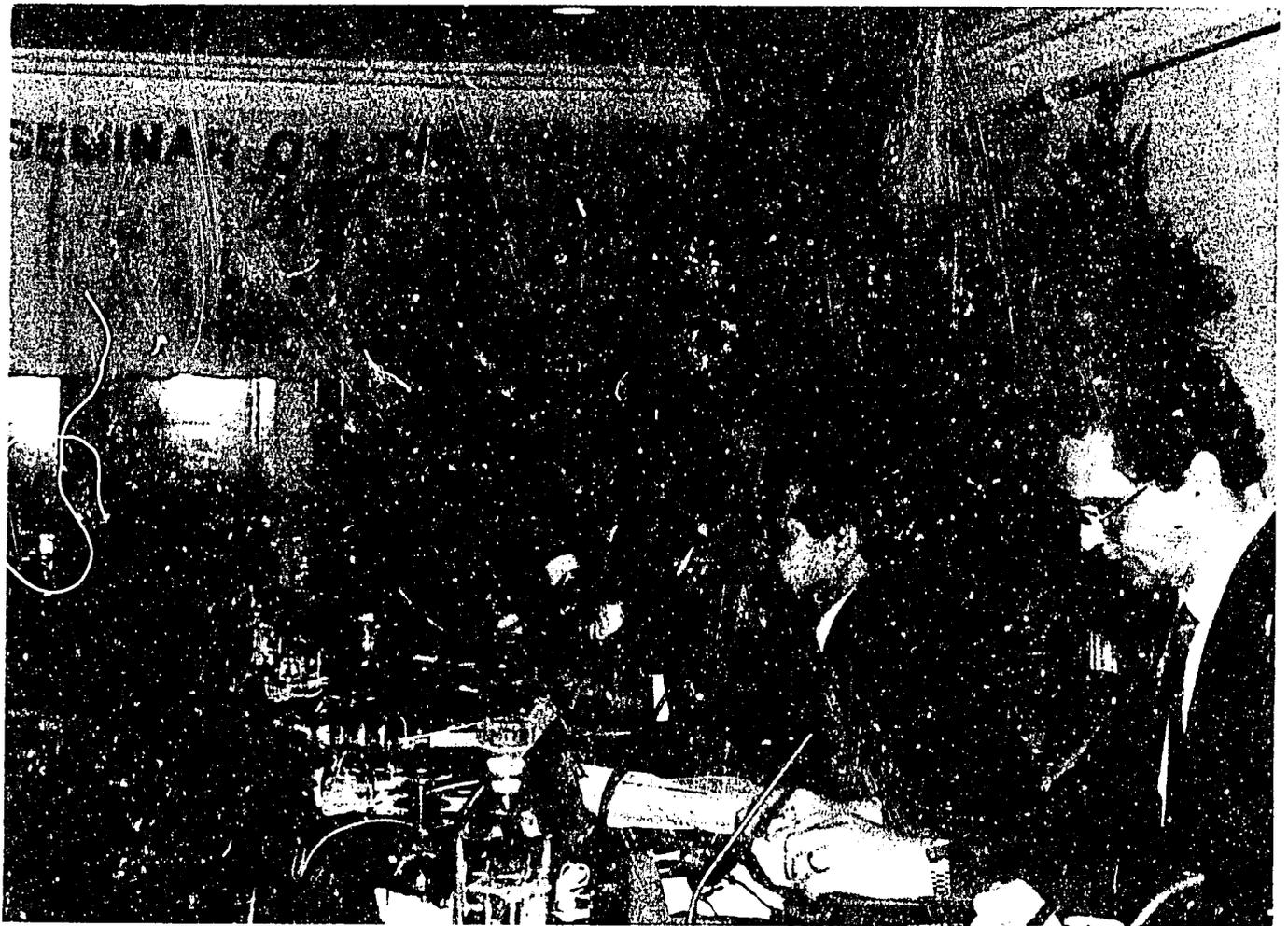
(Panel of Seminar Moderators)

- *Representative of the Ministry of the Interior*
- *Representative of USAID/Morocco*

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## **WELCOME AND INTRODUCTION**

**presented by**

**Mr. Driss Toulali, Director General of Local Government,  
Ministry of the Interior, representing the Minister of the Interior**

Mr. Representative of the Ministry Economic Affairs and Privatization,  
Representative of USAID,  
Presidents of the Municipal Councils, Experts, Ladies and Gentlemen:

It is a great honor for me to open this first technical seminar on the privatization of the collection and treatment of household waste.

Everyone knows how much this sector affects the environment and what its direct implications are on the sanitation of the surroundings and the health of citizens.

This is why local communities pay particular attention to the collection and elimination of household waste in the framework of a global strategy aimed at improving local public utilities and a new national policy of liquid and solid waste disposal for our cities and towns.

Allow me at this time to thank and pay a special homage to USAID which was kind enough to contribute to the organization of this meeting essentially dedicated to our joint consideration of the elements of a new management system which would call on the private sector's genius and potential.

I also wish to thank all the people who were kind enough to respond to our invitation and came from all over Morocco as well as from abroad to bring their experience and contributions to our thinking through this problem together.

Thanks to the High Instructions of HIS MAJESTY THE KING, our country has been resolutely committed to engage in the direction of decentralization, especially since 1976.

The Administration has asserted its ambition to make the municipality a base structure to meet all the needs of general interest regarding the citizens' everyday life and to satisfy the fundamental aspirations of the people. It also is the dynamic cell for the promotion of the local economy, satisfying development needs, creating jobs, and the development of public utilities. The municipality therefore takes on more and more duties and receives more and more means.

One of the virtues of decentralization is to have revealed the sensitive parts of the solid waste disposal sector, including the accumulation of the needs and the urgency of intervention in this area, with greater efficiency and productivity.

The conditions of demographic evolution, the rhythm of urban growth, the increase in consumption, and the greater and greater demands in favor of public health and that of the environment mean the implementation of new methods to approach new organizational, financing and structural solutions linked to the chain of disposal and elimination of the nuisances and negative influences created by waste.

A few numbers will show what a great effort municipalities must put forth in order to face the various tasks necessary to bring this mission to a successful end.

- \* In fact, the urban population has gone from almost 3 million in 1969 to over 30 million in 1990;
- \* The tonnage of household waste to be collected daily which was 1700 tons 30 years ago is now estimated at over 8000 tons. It means more than 13000 cubic meters (roughly 43000 cubic feet) of waste and debris daily, which involves a very large site which must operate every day with an assured regularity.

The municipalities must consequently equip themselves to face these flows of waste. The annual cost of waste collection is estimated at near 30 billion centimes.

As regards investment, the municipalities have invested more than 90 billion centimes over the past decade.

The technical solutions adapted to the types of Moroccan waste were specified particularly at the time of the studies and experimentation conducted by our Moroccan experts with the support of friendly countries.

With regard to the elimination of waste, 3 household waste treatment plants are in operation, numerous garbage dumps have been eliminated. But numerous problems still persist at the running and financing levels.

The technical problem of choosing collection and treatment procedures is important if we want to avoid the setbacks caused by facilities planned for other countries which have dry waste, whereas our waste is 70% water and does not include the high volume of packing materials which concerns European and North American countries so much.

As for the management problem, it is the core of the concerns experienced by the officials of these municipalities.

Generally, the services of Moroccan cities are managed directly by the local authorities. The Salé factory operates within the framework of a management agreement made with an autonomous agency.

But the Moroccan legislation remains open to other management formulas where the private sector may be called upon to demonstrate its competency in the search for improved performance.

The privatization of public utilities began in the urban transportation area. It could be extended to other local services if the feasibility conditions were put together.

The cities in the Kingdom are at an important moment when they must devise choices in order to obtain significant results in this area.

It is important that the elected officials have all the information at their finger tips before making their decisions; they need to know whether the processes and means of implementation can be adapted; they must also know the present costs of the services now in place and the future costs and have an understanding of the private sector.

In order to achieve this, it is useful to profit from the experience acquired by other countries which have obtained results and to know the conditions which must be met so that privatization can succeed and the remaining objectives -- even though they may be those of a public service under the authority of the community -- may be successfully implemented.

This is what brought us to organize this seminar which -- as regards our own experience -- will bring us the most recent American experience for new visions of the organization of household waste disposal services.

I wish complete success to this seminar which will mark, I hope, a new stage in solving the urban problems which at present affect our cities.

## OPENING REMARKS

presented by

**Mr. A. Guessous, Director of Fund for Compensation of Morocco,  
representing the Minister of Economic Affairs and Privatization**

### I - INTRODUCTION

At the beginning of this year, 1992, is it necessary to still wonder whether it is opportune to proceed with privatization at a time when countries formerly subjected to a centralized state economy resolutely privatize companies?

For these countries, as for many others, it is actually not a question of choice but of absolute necessity so as to free asphyxiated economies.

As far as our country is concerned, this question has no longer been one of timeliness for the past few years. The legislative and regulatory frameworks required in this context have been implemented and a first course of privatization operations have been launched. The question which is raised about the collection of household waste is also asked about most of municipal services, such as:

- solid waste disposal (this is the case for us);
- liquid waste disposal;
- distribution of drinking water;
- distribution of electricity.

It behooves us to note first and foremost that each of these services has its own specific attributes from various technical, financial, and institutional points of view and requires in-depth studies.

However, their privatization, when it occurs, aims at a single objective: to ensure that the consumer will benefit from better service at the lowest cost.

At present, the great majority of the municipalities in Europe and the USA have transferred their solid waste disposal to private enterprise. For instance, Paris City Hall has a concession contract with S.I.T.A, a specialized company launched by the Lyonnaise des eaux group.

The annual turnover from this activity in France amounts to some 16 billion French francs. Not gold mines necessarily, though even many mines at present experience difficulties, but certainly it remains a source of added value and of job creation.

An example of a utility service which has been provided by private companies for decades is the production and distribution of electricity. These very effective companies called "utilities" still grow within a very strict legislative and regulatory framework at both the federal and state levels in order to assure the quality of the service and to protect the consumers against possible abuses. Their profitability, which is framed by a price ceiling and floor, make them blue chip investments at the stock exchange.

Let us go back to the solid waste disposal service in order to examine the various institutional, technical and financial aspects and to be in a position to assess its future prospects.

## II - MUNICIPAL HOUSEHOLD WASTE COLLECTION SERVICES

a) Demand is growing at an increasing rate due to the urbanization phenomenon together with demographic growth.

In a 25 year period, the amount of household waste to be managed daily in all the municipalities has gone from 1600 tons to more than 8000 tons, which translates into an average rate of increase in the 7% range at a pace equivalent to that of the demand for drinking water and electricity in urban centers.

b) With the exception of the special case of Rabat where the R.E.D. is in charge of managing household waste services, this particular service is managed directly by local communities under local government control with their own resources, both human and material.

c) From a financial standpoint, there are no individualized municipal revenues for solid waste. The entirety of the costs for supplying household waste services -- as regards to both investments and operations -- is supposed to be covered by local taxes, balancing subsidies granted by the State and, if applicable, loans for new work projects or the acquisition of new equipment.

This latter point creates major difficulties, for in the final analysis these local communities do not have the resources to enable them to renew their equipment and rehabilitate their facilities which have become antiquated unless, of course, a subsidy has been granted to them for this purpose.

d) From a technical standpoint, the household waste service, once limited in Morocco solely to the collection of garbage, has seen in the past twenty years the emergence of several composting plants aiming at the valorization of all or part of its refuse in the form of compost which makes, if not a good fertilizer, at least an excellent enriching agent for certain types of soils.

However, the operation of these plants is experiencing numerous difficulties linked to the equipment maintenance and the compost flow for which the potential market in Morocco is nevertheless significant. Moreover, the waste collection rate does not appear satisfactory.

### III - ASSESSMENT OF THE PRESENT SITUATION AND PROSPECTS FOR THE FUTURE:

a) The direct "local government control" formula management method has shown its inadequacy. By the same token, from a technical standpoint, it has been demonstrated that the treatment of waste in composting plants in principle aiming at their valorization, is not a miracle solution. Furthermore, these plants should be properly operated.

In addition, the present financing mode, for the current costs as well as for investments, is lacking. In this respect, it is imperative to set up a price scale for services rendered to the user that takes into account changes at the level of price scales adapted to the socio-economic context.

b) This is actually a question of true industrial and commercial activity which requires a rigorous management of material and human resources which in order to get good service at a minimal cost.

The treatment of debris, instead of its disposal either in a composting unit or in a power station, or any other way, is nothing but a way to compress the overhead of the service rendered to the user. In fact, there is a complementarity and not an opposition between the plant and the disposal which in any case must be properly implemented and controlled (fence, security, eventual restoration of the soil, etc.).

c) These are the constraints of a company in the complete sense of the word and it is in a private framework where it is best to engage in this activity.

From the institutional standpoint, there is nothing to oppose this since article 30 from the Dahir bearing Law Nr. 1-76583 dated September 30, 1976, dealing with municipal organization provides that among the duties of the Municipal Council,

"It decides on the creation and organization of municipal public utilities and on their management, either through direct local government control or autonomous control, or through a concession."

The case of the city of Rabat where the composting plant is run by the R.E.D. in the framework of a simple management contract where the operator does not have full responsibility is nothing but a stopgap measure.

d) The preliminary conditions for the implementation of a privatization program of household disposal municipal services include primarily:

- Defining an appropriate price scale
- Implementing a legislative and regulatory framework to control the relations between the users, the company, and the community on the one hand, and on the other to preserve the environment

e) These are the principal elements required to establish precise schedules of conditions allowing the company to whom the service will have been granted to fulfill its obligations under the best conditions and at the least cost to the user.

#### **IV - CONCLUSION:**

**The privatization of a household waste service, such as that of other municipal services like liquid waste disposal, is not only possible but desirable.**

**It is a long range task which would require pilot operations at the start. Generally speaking, the separation which has begun between the public and the private sectors appears more and more artificial and, from an economic standpoint, there is nothing in the way of a public service being rendered by private enterprise in a precise framework established by law and regulation.**

## **OPENING REMARKS**

**presented by**

**Mr. Dennis Chandler, Mission Director,  
U.S. Agency for International Development, Morocco**

Ministers and their representatives who are present,  
Directors,  
Presidents of Municipal Councils,  
Ladies and Gentlemen:

In the name of the United States Agency for International Development (USAID), I would like to welcome you to the first conference on the Privatization of Waste Collection and Treatment in Morocco. I would also like to thank the General Directorate of Local Government of the Ministry of the Interior, the Economic Affairs and Privatization Ministry, and the International City Management Association (ICMA), for their contribution to the organization of this seminar.

The topic we will discuss during these two days is a major concern for all the local communities and of major importance for Morocco where a rapid urbanization is occurring. And, because of the urgency of the problem and its impact on social and economic development, USAID has also recognized it as a high priority of its cooperation program. But, first of all, it is up to you, the presidents of the elected municipal councils and technical managers responsible for public utilities, to find effective solutions to the problems related to waste management. Among the alternatives you will examine to solve this problem in your city, the privatization option -- which is the topic of this seminar -- certainly appears to be a realistic solution.

When the General Directorate of Local Government and USAID began to set up the program of the seminar, we agreed that you, the local affairs administrators and decision makers, did not wish to spend these two days listening to lectures given by consultants specialized in the subject. Rather, we thought that this first meeting should be an opportunity to let you benefit from the experience of public officials and private enterprise in the United States and elsewhere, who are already involved in the privatization of waste collection and treatment. I hope that our guests will help you to identify pertinent approaches to successfully bring the private sector into the waste management system here in Morocco.

As you certainly know, the United States Government, through USAID, works in concert with both the Moroccan private and public sectors on various projects aimed at assisting Morocco in its growth and development. These projects include different activities in the framework of which USAID is collaborating with the General Directorate of Local

Government to implement new approaches to urban environmental management. For instance, in the technical and training assistance program for the Tétouan Urban Development Project, USAID is co-financing the Liquid Waste Disposal Guidelines established by American and Moroccan research departments. These guidelines differ from other studies now in progress in Morocco because the city of Tétouan is the contracting authority of the study and the latter includes an important analysis of the environmental impact, purchase of materials for the maintenance and upkeep of the waste disposal systems, and a training and technical assistance program to the department responsible for urban environment. Furthermore, in Tétouan, USAID and the International City Management Association (ICMA), the contractor, are collaborating with the municipal officials to set up a strategy which will enable the city to progressively implement a privatization plan for waste collection and treatment downtown and in the medina. And, an engrossing initiative is just about to be launched -- The city of Raleigh, North Carolina, is assisting the city of Tétouan in establishing an environmental serving department.

In Morocco, as elsewhere in the world, waste management is a problem which can no longer be ignored. We are already witnessing direct nuisances which result from inadequate management of waste collection and treatment. These contaminate the ground water tables, emit noxious fumes which go into cities and threaten the health of every citizen.

Most of you know very well the issues connected to waste management. Unlike other important municipal services such as supplying water and electricity which are often managed by local or interprovincial authorities, waste collection and treatment services always are the responsibility of municipalities and have a high cost.

The privatization process you will choose must rely on an effective system and be adapted to the Moroccan environment. For privatization to succeed, two absolutely fundamental and indispensable conditions must be met:

- a) the service provided by the private sector must be at least as satisfactory -- and preferably more satisfactory -- than that offered at the present time by the Municipality, and
- b) the services supplied must, in the long term, be profitable for the private sector.

However, and this has been demonstrated many a time, ambitious privatization plans fail because only one of these fundamental conditions -- and not both -- has been met.

Several essential elements are necessary to the success of a privatization program. First, political willingness; the elected officials must bring their support to the administrators and provide the judicial framework enabling the proper execution of collection and treatment activities. Realistic regulations must be established and the elected officials must see to it that they are enforced.

Second, an effective system presupposes adequate waste treatment by methods such as landfills, composting, recycling, or any other. The sensitization and education of the public are also essential to the success of a waste management program.

Last, any municipality must pay particular attention to the financing of the required services. It is only after having defined what the waste management services will cost that a municipality can establish the advantages of privatization.

Finally, before they can implement a privatization program, municipal officials must make an accurate evaluation of their co-citizens' ability and willingness to pay for the services provided by the private sector, through taxes or fees paid by the user.

We are lucky to have among us professionals and local authorities who are firmly committed to improve waste management in Morocco. Let us hope that the discussions which will be held during these two days will bring you additional information and will acquaint you with new approaches to take on the responsibility of this important public service. Given the long road ahead of us in the course of this conference, I give you the floor and thank you for your attention.

# THE COLLECTION AND TREATMENT OF SOLID WASTE IN MOROCCAN CITIES

presented by

**Mr. Ahmed Chouqui Bennani, Director of Capital Budgeting of Refinement,  
Directorate of Ministry of the Interior**

## A - PRODUCTION AND COLLECTION OF SOLID WASTE

### 1. - PRODUCTION OF WASTE

The production of solid waste is tied with economic and social development. The output reaches, in Morocco, more than 8000 tons/day, compared with just 1600 tons/day in 1960. This solid waste is a threat to the environment and a danger for public health.

This danger is present where the waste is created right in the households, especially if the waste cannot be evacuated fast enough such as during the tourist season. The danger exists also where the wastes are disposed, either in the streets when the packaging of the solid waste is defective (which happens often) and the collection is too quick and not handled carefully, or around the containers where the users drop their refuse; the danger is also at the dumping sites, more often and very justly referred to as "rubbish dumps".

The most significant problems are observed around the large city dumps, especially Casablanca's dumping site in the Médiouna quarries, which pollutes the water table and "attacks" the traveller coming out of Casablanca by its appearance, and the smells and smoke that emanate from it.

The urban population of Morocco reached more than 13 million inhabitants in 1990, and the demands for an improved quality of life from the public are greater and greater. These two considerations have brought local governments, in charge of the collection and disposal of solid wastes which are considered a public service, to consider the necessity of establishing an operation capable of addressing problems of hygiene, public health and environmental protection.

The annual cost to collect household solid waste is assessed at 30 million of Moroccan centimes, or 25 to 30 Dirhams per inhabitant, per year, but with great discrepancy between towns, as will be shown in other reports. This figure must also take into account that it is often difficult to differentiate between the actual cost for collecting and the cost to clean the streets and roads (such as sweeping etc.) given that these services are interdependent.

An investment of 90 billion Moroccan centimes was made during the past decade to purchase vehicles and collection equipment.

This effort consisted essentially of buying trucks with packing dumpers, in an effort to address the need for a more discreet and more hygienic way of collecting the solid waste.

We shall see later the limitation of this kind of equipment.

There is a real effort from local governments to take care of the collection of solid waste. However, pressed to increase their services to keep up with the fastest growing urban areas, they are often behind and then have a tendency to neglect the peripheral parts of town.

The figures quoted above remind us also that these are services that require a lot of labor, expenses for which will come out of the maintenance part of the city budget instead of from investments.

Finally, the service for disposal and treatment of the solid waste is not as well addressed, with the local governments having yet to understand that these services are as primordial as the collection of the solid waste.

The solid waste in Morocco differs from the solid waste produced by developed countries in Europe. It contains a large part of organic waste (+65%), and presents a ratio of humidity (65-70%) almost double the European waste.

These characteristics imply specific steps during the collection as well as the treatment of waste.

## **2. - COLLECTION: A REQUIREMENT FOR PUBLIC HEALTH, ENVIRONMENTAL PROTECTION AND QUALITY OF LIFE**

The means of collecting solid waste in Moroccan cities is extremely varied and adapted to the terrain and the size of the roads. In the same town, a mule-drawn cart may be used as well as trucks with packing dumpers and trucks with covered or uncovered dumpers. This adapted equipment takes care of the need to collect refuse in small and narrow streets as well as in larger avenues of more modern areas.

Additional examples will be presented during this seminar and, therefore, we shall only keep the key points.

Because of Morocco's growing urbanization, trucks with dumpers, covered or uncovered, are the most commonly used collection vehicles in those areas where they can be used and to the extent that the financial capabilities of the city allow.

Many towns require their communities to collect their waste indirectly by putting it into containers provided in different parts of the town, where door-to-door collection cannot be implemented.

These shortages, combined with street cleaning and a lack of adapted city regulations, often leave the services responsible for collecting wastes facing, in the peripheral parts of town, wild and illegal dumping sites around containers and elsewhere. These types of waste

cannot stay too long before starting to ferment and becoming an increasing source of disease.

Very often the rules and regulations applying to the disposal and collection of household waste in the municipalities are very ancient and not adapted to today. Very few new by-laws concerning this topic have been adopted during the past few years. Moreover, the existing laws should be strongly enforced, and the health department of local communities could and should play an important role concerning this matter.

It is important to note that the shortcomings of these cleaning services are compensated every so often by clean-up campaigns, during which additional help is provided by the State and the Regional Collectivities, and more importantly, the labor help of the National Promotion.

These campaigns prevent illegal dumping sites in urban areas from spreading too much and help the municipal services to focus on their objectives.

Yet we have to place the collection of solid waste within its context of maintaining and cleaning the town streets and grounds.

Municipalities face the same financial difficulties in maintaining the cleanliness of the town roadways as in developing a performing network for collecting waste throughout the town. Moreover, the unsanitary dwellings that were built before the roadways were completed prevent important expansion of roads from being built on the towns' outskirts.

These handicaps often discourage a concerted clean-up effort and the development of new routes of collection that would be tough on the equipment.

It is important, however, to note that the cost of cleaning is low, about 30 Dirhams/year/habitant, and to ask the following questions:

- \* If we improve the quality of services, will that double or even triple our cost?
- \* Which municipality can afford it?
- \* Which specific returns could we expect?

### **3. - ORGANIZING THE COLLECTION**

The equipment conceived for collecting European waste, which is drier, is not adapted for the Moroccan waste, which contains a lot of water that is released during the pick-up of the waste and leaks on the road. This is the case, for instance, with the trucks with packing dumpers that are so popular for their large loading capacity.

These vehicles are overused for those pick-up routes that offer the best ratio of amount collected versus gas and wear and tear on equipment, leaving non-adapted trucks for the rest of the network.

Thus, the collection and the quality of the services offered are vastly affected by the ability to maintain an adequate number of trucks in working order.

Moreover, it is important for the administrative services to be aware of the requirements for maintaining the imported equipment, for instance warranty, spare parts and the technical abilities of the personnel who will run it.

Providing new equipment cannot in itself warrant the regularity and the quality of the collection.

The introduction of new equipment -- containers picked up by the trucks with packing dumpers, plastic or paper bags -- will be tested as part of experiments planned in Rabat.

Transferring systems are also being experimented with between Rabat and Casablanca.

Purchase of new equipment and renewal of the existing fleet should depend on the results of these experiments and be included in a general plan that would give priority to systematic maintenance of the equipment.

In this respect, it seems that the municipal administrations would benefit if collection services were taken over in part by the private sector. In order to have the best collection routes in the towns, the dumping sites should be planned as part of the urban development. This would allow planning for a space big enough and at a correct distance from the town outskirts so the number of trips would be kept to a minimum. This planning should be part of an overall strategy which would include sufficient labor and equipment.

This overall strategy defining the service and the routes of the collection would give the towns a general diagram for the collection of their solid waste.

However, as a complement to the current experiment, the pilot testing, and the behavioral studies (led by ENAU in association with foreign partners) done on the users in Meknes, in Rabat, the municipalities could volunteer to pursue some association with the private sector to provide cleaning services.

Even if it appears difficult to do so for small and less fortunate municipalities, such as the ones located around greater Casablanca (unless new possibilities are found such as during this seminar), it seems that wealthier municipalities could, with less risk, try to find new solutions to collect their waste.

For instance, in the modern areas, the use of containers, in turn picked up by dumper trucks, could be instituted along with an increase in the size of the dumpers and a reorganization of the teams.

But only after experimenting could these solutions be considered in less modern parts of town.

Also there is nothing preventing the start of a bag collection system in residential areas.

But, any future partner is advised against making offers before there has been some kind of preliminary study, and all contracts must be submitted to an agreement based uniquely on the feasibility of the procedure.

The teams are composed of municipal employees earning low-scale salaries, who make an incredible effort if we consider their "tools" for collecting solid waste - generally a straw basket that they often have to lift up to the dumping truck type TP or City of Paris.

It is true that the amount of lifting required is more and more limited at the level of the receiving container on the dumping truck, but in any event, they do work fast. However, they work often "half-way" and their irregular schedule results in the waste remaining for long mornings on the street, and pieces of the waste falling on the road.

To question the way the system works is impossible in this context, unless the municipality can raise the wages of the workers quite significantly

Better salaries for the group of workers within the private sector would allow for a better organization of the collection and better service, but at what cost?

## B - TREATMENT OF SOLID WASTE

What to do with the solid waste collected?

For a long time this problem was never addressed by the service in charge of collecting. There was enough land around the towns where the waste could be dumped; sometimes it was dumped in the ocean, sometimes in a wadi, both offering the advantage of evacuating the solid waste either with the tide or the flow of the river.

Consequently, the beautiful water network in the Medina in Fès was used for a long time as "a sewer" for solid waste and for used water, and many seashore towns have been dumping from the top of the cliffs, near the area they just serviced.

As for landfills, they were, at least, the site of reclamation activities more or less intense -- herds finding ways of feeding themselves, and the ragmen reclaiming enough that could be sold or traded -- all this without much bother for the neighborhood or the environment.

Some farmers, especially garden farmers, were often interested by these muddy dumps which could take the place of fertilizer at a much better price, to the point they would take charge of cleaning the sites on a regular basis just to insure a regular supply.

In Rabat, the Municipality offered the maintenance of the site under an allocation of contract, the adjudicator selling the sludge to the garden farmers after a quick cleaning.

In Agadir, the management of the dumping site was done under better overall financial conditions: a private contractor would clean the sludge before selling it.

The treatment was composed of hand picking, grinding and sifting, and then the sifted sludge was left to ferment after being watered and sprayed with a nutritive solution (sugars and peptones). The temperature would quickly reach 60° Celsius in the piles and would stay constant for many days, which would be enough to destroy most of the pathogenic germs, and could be used afterwards as "hotbeds" to stimulate the growth of the tomato plants of the Souss area.

These different experiments showed that many farmers who lived around the towns were interested in the sludge, but they also showed the shortcomings of the methods used, either when it comes to hygiene or to their adaptation to new contexts.

Indeed, things changed in the past few decades with drastic urban growth: an increase in population and a burst of urban perimeters for urban development, both planned and spontaneous, and this has been complicating the municipalities' task of evacuating solid waste:

Bigger volumes, overspreading dumping sites and sources of harmful effects, less and less tolerated at the edges of towns, solid waste washed ashore and totally incompatible with coastal tourism, dumping in wadis that affects the villages downstream...

It became necessary to close old dump sites and to look for bigger and more remote ones.

We can say that generally the new search was done without any planning; the new sites will be saturated in the very near future and were chosen without any prior studies, and most often to avoid costly new land purchases and installation costs, and close to the cities in order to prevent the routes of the collection trucks from being too long.

This last point needs to be explained. Indeed, the use of large-capacity trucks, and sometimes the use of a transfer center, is a requirement if the use of a distant dumping site is going to be cost-effective. The extra costs associated with a fleet of smaller trucks brings up the questions of overall operation costs.

In addition to the quantitative variations, there were qualitative changes, some, for instance, almost unheard of some twenty years ago -- plastics, bags, sheets, bottles -- which are now a very visible and important part of solid waste.

Unlike organic waste -- fruit and vegetable peelings, leftovers, wood, papers and cardboard, etc. -- plastics take a very long time to decompose, and remain along the wadi edges or litter beaches. And of course, the farmers do not appreciate having to sift them from the sludge.

Precautionary measures for the environment need to be taken in selecting the dumping site and in installing it, a topic we shall cover later.

Moreover, these qualitative changes have brought other predicaments for the public health -- these dump sites are, in spite of prior recuperation in the dumping chain, attracting large crowds of people who often work with bare hands and near machinery. Accidents happen, and the danger for their health is high at the large dumping sites.

To solve the problems they are facing, towns today have to pay greater attention to the collection of solid waste.

The choice of a site must fill many needs, distant enough from the urban area or future planned developments, without extending the transportation time.

There must be no risk of polluting surface waters or the water table used for drinking water. There must also be a portion of land set aside for people recovering waste. Furthermore, a management plan must be installed to run a real dumping site. It is not acceptable any longer to discharge the dumpers on the ground or on hill sides. It is necessary to flatten the solid waste with equipment that is able to push and to drive on top of it, gradually, as the trucks come to dump. Tracks must be traced so the dumping trucks are able to arrive "right in front" of the dumping sites. A layer of dirt must be applied regularly on top of the waste to circumvent any further problems. Fire should not be utilized as it creates smoke and foul odors.

In the past few years, procedures have been established to rationalize the choice of the sites, to supervise their installation and to promote a management scheme at once consistent with environmental protection and public health and adapted to the special characteristics of Moroccan household solid waste.

Examples include: projects in Casablanca (planning of the Médiouna, an experiment of unloading waste, without covering it with dirt) Marrakech, Rabat and Oujda, where research has been undertaken for new sites with the help of the administrative services concerned with the protection of water supplies and the environment.

Some cooperative groups now realize that investing in real estate will be essential in the long term, and have taken steps toward that goal.

However, it is not viable to think that a dumping site, even with a budget big enough to install it, will solve all the problems raised with treating solid waste.

There are no landfills in Morocco that are supervised, per se, that could serve as models, and it is difficult for the municipalities to accept an increase in their budget from 2 to 12 dirhams/person, for projects that still raise great suspicion.

In the face of these misgivings and increasing constraints on dumping waste, the local authorities pose the question to the technicians: Is there any new way of processing waste that would enable us to solve the problem safely and economically?

Actually, there are many offers to replace the landfills with processing plants.

Many big cities in the world use burning processing plants to incinerate their waste, recovering the energy and converting it into steam to heat buildings or supply electricity. Only then, ashes and "slags" have to be put in landfills.

Sludge composting is another method commonly used to treat solid waste: the purpose is to isolate organic matter -- by eliminating undesirable elements such as glass, plastics, metals - - and to make it ferment in order to raise the temperature naturally and to obtain a "hygienic" compost similar to manure.

In the past few years, new ways of processing waste, besides these two very general methods, have been developed. For instance, more extensive ways of sorting out the waste to extract diverse constituents from an ore, or isolate combustible matters, and to package it like pellets to stock, or condition it as building material.

They resorted to digesters to produce methane -- a flammable gas -- as well as an agricultural compost. They also tried to "pyrolise" waste to produce hydrocarbons

Unfortunately, there was no experiment that was really conclusive. Very few plants survived the early technical difficulties and stayed in business, and those that did, did so in spite of balance sheets that were not as positive as expected. Many others closed their doors or had to undergo significant changes.

Overall, there is always a need for landfills. They will get smaller as the dumping grows, and will need to be kept apart from urban areas. The need to search for large and remote sites remains nonetheless.

As early as the sixties, Morocco turned toward composting; after all, the farmers had always been interested in the "sludge". And the specific properties of the Moroccan towns' solid waste, principally its humidity, were an inducement to avoid incineration.

The first "pilot" plant for sludge composting was opened in Rabat in 1961. Of modest capacity -- 50 tons/day -- it was initially intended to fine-tune the adaptation to local conditions, and to take advantage of the potential market of 1,000 hectares of vegetable and orange groves that could be found a short distance from the plant.

Good results promoted the construction of new plants in Tétouan, Marrakech, Méknès and an extension to the Rabat plant. The city of Casablanca started building a plant of larger capacity, 700 tons/day, using a different process for composting. The poor performance of the plant generated problems for the urban area nearby, and the plant was shut down after a few months.

There was a long litigation and the builder was found responsible for three-quarters of the failure and had to pay high compensation fees.

This unfortunate story was disastrous for the whole sector. It not only made the municipalities painfully aware of contractors offering a "miracle solution," but also prevented them from focusing on the difficulties in the processing, due essentially to inadequate management (such as lack of maintenance and new equipment, poor selling/marketing, lesser quality and greater pollution of the compost) affecting the functioning of the plant and sometimes closing it down, and raising increasing questions about the validity of the compost process.

To find solutions, a program was started by the Franco-Moroccan cooperation services, to study the difficulties and possible solutions for the rehabilitation, if possible, of the plants and to create new solid financial and economical foundations for new ventures.

New tests performed, first in Rabat then in Méknès, resulted in 1988 in positive findings, allowing the compost process to go through a simplified line, without having to go through a grinder, an expensive piece of equipment requiring a great amount of electricity.

The new line, which also guarantees better elimination of undesirable elements, consists of three different stages:

- fermentation
- sifting
- storage

and must be situated on a dumping site.

This type of plant has to be installed quickly in Agadir (200 tons/day) by its local government and then in Marrakech to replace the already existing composting systems.

Specifics of this line are explained in another part of this seminar.

Should we assume that dumping under good conditions on the one hand, and sludge composting, adapted for and as developed by Morocco, on the other hand, are the only two solutions for treating solid waste within the Moroccan context?

We could say "yes" to sludge composting where the market exists (this aspect will be addressed later) and "yes" to dumping in any case.

It would be precarious to encourage the municipalities to try anything else. However, if a private contractor is ready, for the same or a lesser price than at a regular dumping site, to "take charge" of the town solid waste, with the same prerequisites for the environment and public health, let him take his chances.

If this private contractor figures, for instance, that he will valorize the solid waste or some other aspects of this holding to make his business profitable, more power to him.

Yet, we do need to reinforce three points:

- The compost coming from a non-refined line might become expensive and, in the Moroccan market, only a refined compost will be profitable and only if a worthwhile market is available.
- The collection activity must take place at a large and remote site from the urban area.
- The need for a "market" is a must in order for a plant to be built or not.

The profits from the compost sales have to cover a decent part of expenses in order for the town to choose this process over dumping. Yet dumping still necessitates remote sites, long runs, and strenuous requirements to protect the environment.

A first study of this specific market shows great potentials for the area of Agadir, El-Jadida and Settat, but we will study this specific case in other presentations.

Technical solutions adapted to the Moroccan context and financial abilities to carry them through are now accessible to local governments.

There is no doubt that local governments will take advantage of these options to replace the "wild" dumping sites or plants with approaches which demonstrate greater concern for the environment and the needs of local farmers, and without a large financial penalty to the community budget.

The solution for the future, within global politics, would be to solve the solid waste issues, and without minimizing the potential of the private sector, by basing the processing of solid waste on financial and institutional structures subsidized with taxes paid by users for services rendered, (with sludge composting or any other way of making a profit being only one way to reduce the fee charged to the user), and finally to find within the global economy the best ratio (between users and farmers). This management would open the door to additional investments, public or private, insuring the good functioning of the plants in service and guaranteeing a better chance for the final product, in parallel with better services and better prices.

The creation, as a result of these institutional and financial reforms, of independent administrative organisms, financially viable and technically reliable, will be the best tool to promote and develop research pertinent to all fields, but particularly to farming, and to teach the new methods in order to remove all hazards.

We believe that these solutions are a good platform for discussion and within the goals of this seminar. It is important for local governments not to focus only on the technical aspect of evacuating solid waste, an aspect that is undoubtedly important but only one of the many factors that we have discussed in this seminar, and with one final goal in mind: collecting and evacuating solid waste under the best conditions at the best price with the best services.

It is in this context that we should approach the question of privatization of collecting waste, opting for solutions adapted to Morocco.

**PROGRESSION OF THE PHYSICAL COMPOSITION  
OF SOLID WASTE IN MOROCCO**

**Table No. 1: situation in 1960**

Constituents	Content in %
- Paper, cardboard, rag	15
- Building materials	0.8
- Glass	0.6
- Metal	0.4
- Plastic and rubber	0.3
- Organic compound	75
- Varied (bone, wood )	8

**Table No. 2: situation in 1990**

Constituents	Content in %
- Paper, cardboard, rag	18 to 20
- Glass	1
- Metal	1 to 3
- Plastic and rubber	2 to 3
- Organic compound	65 to 70
- Varied (sand, stone, dirt..)	5 to 7

The average density is 0,40% and the humidity rate fluctuates between 65 and 70%.

## DISCUSSION FOLLOWING THE PRESENTATION BY MR. BENNANI

### MR. TOULALI

I would like to personally thank Mr. BENNANI for his presentation, the wealth and pertinence of which translate the lecturer's earnestness and competency. Of course, this presentation includes an assortment of criticisms, propositions, and questions you are invited to convey to Mr. BENNANI to open this morning's first debate. The floor is open.

### QUESTION

#### MR. J. PERREAUT

I would like to ask Mr. BENNANI to explain further how contractors can succeed in implanting themselves and recoup their investment and equipment costs and naturally their operation costs.

### ANSWER

#### MR. BENNANI

This is a very appropriate question. In a general presentation it is difficult to go into detail to give the components of the collection cost (personnel, means, etc.) as well as the landfill costs, and, as I pointed out in my presentation, examples will be given this afternoon -- more particularly the case of Casablanca -- to show how difficult it is to approximate the cost in the present context. Until now, in all the estimates which can be reached on the basis of sometimes long studies, we can only arrive at an approximate cost given the fact that there are a certain number of operations which come into the mass of the municipality's overall management.

As an example, the packing bins are repaired in the city plant which is also used for other services without individualization of the costs pertaining to this repair.

In turn, the staff is used for other operations.

In many countries, the cleaning and sweeping department is not assimilated into the collection service proper. In my presentation, I avoided going into detail while still drawing the private sector's attention to the need to study the present cost before

conducting the feasibility study of the project, and trying to take into account the technical solutions adapted to the country which would allow this cost to be reduced.

### QUESTION

#### MR. DE LA RUE

In the privatization framework, it is important to discuss the length of the lease. How long do you think a lease with private contractors should be? Do you favor long-term leases (10 years and longer) or do you favor three-year leases. You know that the amortization of the equipment depends on the length of the contract.

### ANSWER

#### MR. BENNANI

As we certainly are going to hear in the other presentations, we will be led to study certain American experiences and we will see what precautions should be taken before calling on the private sector as well as what guarantees should be given to the private sector so that it will be interested in taking on some or all of a city's household waste service.

In fact, each case must be studied separately with respect to the availability of land, the landfill situation, the condition of the equipment which would be made available to the contractor, and the investment the contractor must make according to his procedures and management methods.

Consequently, there are several formulae which will be studied during this seminar. Moroccan legislation is open to all kinds of contracts.

It is a question of feasibility and negotiation between the two parties who must determine the conditions for privatization.

#### MR. TOULALI

Mr. DE LA RUE, let me add to what Mr. BENNANI said that your question constitutes a specifications element which must link the concessionary company to the individual or to the firm which performs the service; therefore, this question is related to a set of elements which must be debated and discussed with the municipality.

#### MR. LASKI

First, I would like to thank the Director of Local Government. As for me, I take part in this seminar with considerable interest, expecting to learn a great deal and, if need be at a later date or during this seminar, to find the solutions which would generally relate to

waste collection and treatment in Morocco -- particularly in Casablanca or still more specifically in the Sidi Belyout municipality. I think that the silence or the small number of questions which followed Mr. Bennani's presentation show that it is thorough and has covered all the aspects of waste collection and treatment as well as all the issues that these two operations raise for the presidents of the municipalities. I must confess that if, as far as we are concerned, we had to present a general report without going into detail about these two operations, we would not have said anything else: in any case, one thing is certain, we could not have done any better for, as you know, in the Sidi Belyout municipality -- given all the problems that waste causes for Casablanca -- we have firmly decided, right or wrong, to try to find something for the Sidi Belyout municipality, thinking that if we succeeded in addressing the problems of this municipality, we could set an example for all the other municipalities of Casablanca. This is the spirit in which we have studied the issue for several years without yet having been able to reach the realization stage. We explored several technical solutions, studied the method of operation, the participation of private enterprise, the nature of waste; we reached the same conclusions as those in Mr. BENNANI's presentation, i.e. the technical solutions which are imperative are a sanitary landfill or composting. We ask ourselves the same questions Mr. BENNANI did, and which can be dealt with in detail at the time of the negotiations with a possible private partner who, in any case as far as the Sidi Belyout municipality is concerned, would be welcome so that we could study together this issue of the privatization of collection proper, but which must necessarily be associated with the treatment of waste.

We thought about the question asked by Mr. DE LA RUE: it is a fact that the cases of the municipalities are rather different. For instance, a municipality could ask its partner to acquire the equipment for waste collection and treatment; or it could simply be a collection problem; and in going through intermediate phases, you would find a municipality which has all the most sophisticated equipment for waste collection. The cases to be negotiated cannot but be diverse. I think that the duration of the concession depends on the investment asked from the private partner. I will cite the case of Sidi Belyout since we are discussing it; I can say without running the risk of making a big mistake -- maybe someone from outside with a fresh look could say something else -- that from the standpoint of equipment, the municipality has enough and that it would not be necessary to add much investment, particularly in the matter of packing bins or containers, since in the Sidi Belyout municipality we have already mechanized waste collection and we have done so progressively, sector by sector. For instance, here is a municipality which is very advanced with regard to waste collection, since the employees do not touch the trash, we have placed containers of all sizes in buildings, hotels, and restaurants, as well as in the little house where only a few people live (smaller-sized containers); pick-up is done every other day instead of every day by half-sectors. Trash cannot be seen. It is in closed containers picked up mechanically by trucks. Therefore, private contractors may have to make some additions in function of the design.

In any case, investment is important with regard to this issue. To my mind, it is not very large for possible investors. From the studies we have conducted, we are about to launch a transfer station and from the costs put forward by certain firms we have consulted, without any engagement on our part. We are at the discussion stage. The cost for transfer stations is not enormous.

Now, as regards composting (landfill is necessarily associated with this) -- and in this sense, I totally agree with Mr. BENNANI -- the composting station or the plant must necessarily be associated with a plot of land. In the case of the Sidi Belyout municipality which lacks land, we would have to go very far outside the perimeter of Casablanca; therefore a transfer station is necessary. In summary, then, there is cause to ask for the participation of private enterprise who to my mind will not be discouraged by the effort demanded of them by the municipalities. Private enterprise will ask itself questions about equipment and personnel transfer, under which conditions we must calm the staff affected by the transfer - there is no question of causing this personnel to be unemployed.

Other matters will have to be negotiated to find new jobs for this personnel either in the private sector or in the municipality. The three points which will have to be negotiated with the private partner would be:

- the destination of the existing equipment,
- the final destination of the personnel,
- the questions of investment and setting tariffs either to the municipality or the public.

Mr. Director, these are some of the ideas I was brought to discuss in order to participate in this debate.

## QUESTION

### MARC BITON (SOCA)

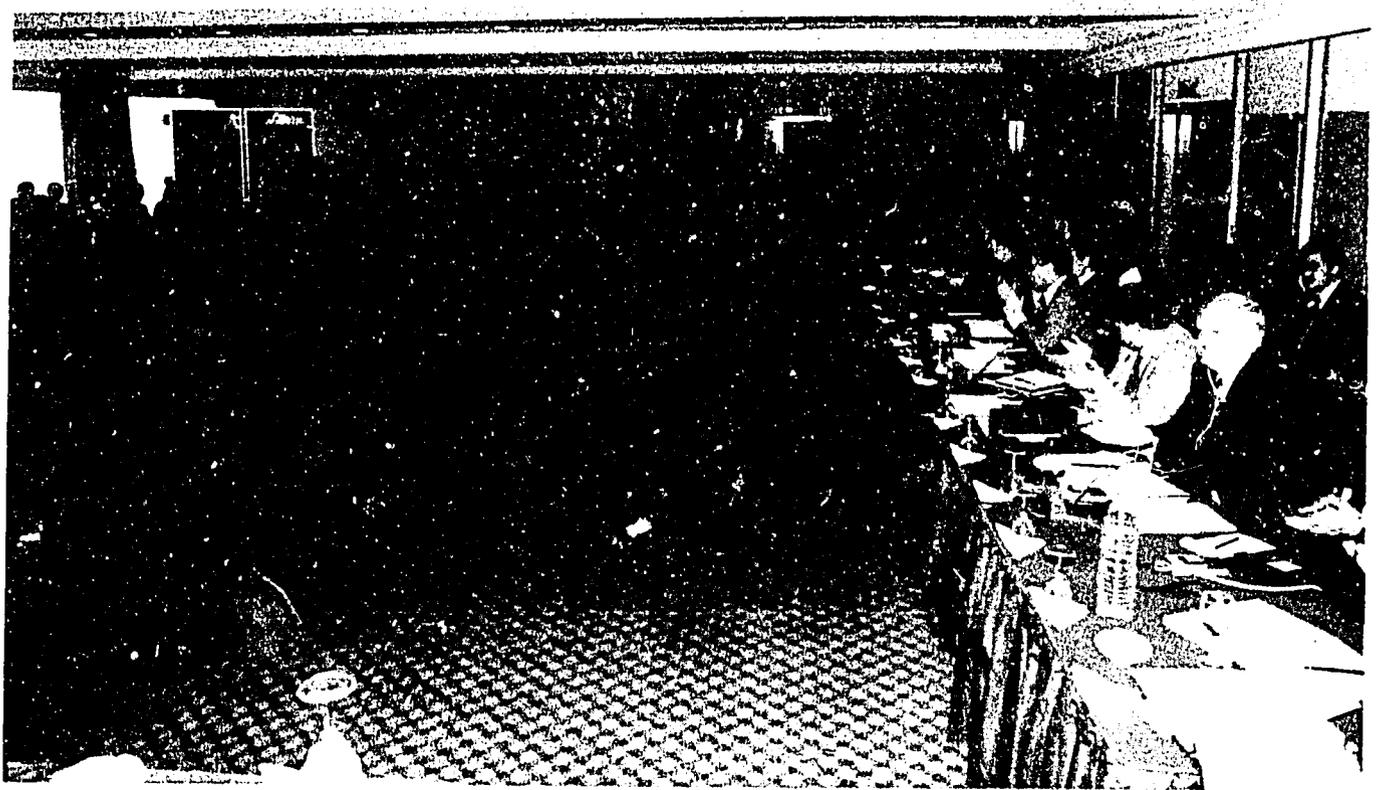
You are talking about investment while at present, in Morocco, there exists no investment code for service corporations. When equipment is imported, the highest customs duties are charged. Don't you think that this puts the brake on privatization?

## ANSWER

### MR. GUESSOUS (COMPENSATION FUND)

The privatization problem is not only economic but socioeconomic. A comparison between the costs of this service in France and in Morocco per inhabitant and per year shows the amount of the GNP in Morocco and the GNP in France per inhabitant.

I say "Yes" to privatization, but it is necessary to have professionals conduct and very thorough research. This research must lead, beyond a contract, to a partnership between the one in charge and the private sector who, will take over from the local community to act for himself for the user's benefit, and perform for the latter a service which must be better and at a lesser cost; otherwise, there is no partnership.



28A

# **PRIVATIZATION OF MUNICIPAL SOLID WASTE SERVICES**

**presented by**

**Mr. Jacques Perreault, Engineering Consultant, ICMA**

## **INTRODUCTION**

Privatization of municipal services is not the panacea for all the financial problems facing the municipalities today. However, it is undeniable that the privatization of municipal services, well researched, well prepared and well followed, seems to have been, for most of the municipalities, who have used this solution, a true source of savings and a way to improve the quality of the service offered to the taxpayers.

A few years back in the United States, privatization was only for big cities. Today, all cities are feeling the economic recession and a decrease in their income, and therefore, small or large, cities are launching themselves in the privatization of services to try to alleviate the fiscal burden on their taxpayers.

The results from the privatization are very positive according to a recent poll done in more than 1,000 cities in the United States. 100% of the cities polled reported financial savings following the privatization of a service, whereas 45% reported an improvement in the quality of their services.

## **WHAT ARE WE PRIVATIZING?**

Most services that cities must offer have been privatized in one way or another. Some cities have privatized only one service while others have privatized many. For instance, some cities have privatized:

- \_ management of golf courses, public skating rinks, public swimming pools
- \_ engineering and architectural services
- \_ maintenance of parks and playgrounds, public squares and streets
- \_ operation of an incinerator, wastewater treatment plant
- \_ collection of household and industrial solid waste
- \_ maintenance of community buildings, jails
- \_ operation of airports, cemeteries, hospitals, marinas, municipal pounds, etc.

## **WHAT INSURES THE SUCCESS OF PRIVATIZATION IN A TOWN?**

First of all, it is indispensable, of course, for local authorities to have the legal right to make the necessary decisions. Secondly, it is essential for the municipal officials to want to carry the project through up to the completion and to put up all the mechanisms to insure the success of the operation. Third, all municipal powers must endorse and support the project. Finally, the privatization will be easier to put in place if there is a financial crisis in the municipality and if the workers are little or not at all unionized.

## **WHAT ARE THE OBSTACLES TO PRIVATIZATION?**

More than 50% of the participant cities in the poll mentioned above, had problems with the city workers unions, as well as some problems with citizens groups who were doubting the saving anticipated or the projected improvements in the quality of the service. Indeed, in all the communities polled, there had been complaints about the quality of the services, long delays before answering a complaint, rotation of staff too frequently, employees underpaid, etc. And the contractors have been complaining about the attitude of some civil servants, late payments and the large number of reports demanded by the civil servants in charge of supervising the contracts.

## **BIDS AND CONTRACTS**

Most service contracts are awarded by the municipalities after a public bidding. Effectively, in 90% of the cases a sufficient number of offers were received by the community to be able to make an educated decision.

Bids are usually made via newspapers and an internal committee (elected authorities and civil servants) is typically created to analyze the offers.

The importance of the contracts varies as a function of the nature of the service itself.

Contracts of thousands of millions of American dollars have been awarded for construction works, fire protection, public transportation, sanitary disposal, streets repairs, etc., with most of these contracts being awarded on an annual basis.

Twenty-seven to forty percent of the contracts for privatization of services are for one- to-three year terms, whereas contracts for operating wastewater treatment plants are usually for twenty- to thirty-year terms.

Contracts are most often at a fixed rate for the services rendered. However, nearly 25% of the contracts depart from this rule and have specific clauses to encourage efficiency, production and innovation.

## CONCLUSION

Privatization offers a way to reduce the costs of services and a possibility to improve quality. We already can predict that, with the recession the world is facing, lower municipal revenues, and increasing demands from taxpayers for new services, the tendency to cater, meaning hiring on contract for execution of services, will go on and probably even go up.

We have seen in this short report that there are many aspects to privatization and that it is indispensable to have understood and assimilated the whole process before starting an operation for privatization. During the seminar we will try to study all the different steps, starting with the feasibility of the privatization of a service, the economic and financial viewpoints, and technical, legal, and institutional aspects.

Then, we will study the terms and conditions for privatization for solid waste services, prior studies, appropriate legal forms, method of payment, contracts, bids, and analysis of the offers.

We will also examine the methods for managing and supervising private solid waste collection operations. Finally, private contractors will give us their views on the privatization for solid waste collection and some anecdotes on privatization of public urban transportation systems.

## **ECONOMIC AND FINANCIAL ASPECTS OF SOLID WASTE COLLECTION**

**presented by**

**Mr. Ahmed Laski, Mayor of the city of Sidi Belyout**

### **ECONOMIC AND FINANCIAL ASPECTS OF GARBAGE COLLECTION SERVICES**

First and foremost, let me welcome and commend the initiative taken by our Minister of Interior to organize a seminar on municipal garbage collection services and let us extend our warmest thanks to him for his steadfast interest in the proper operation of local communities which are the foundations of democracy. This seminar provides communities with an excellent opportunity to further enhance the quality of public service and meet the various needs of their residents.

Prior to addressing the economic and financial aspects of garbage collection services, allow me gentlemen to give you some background about the urban community of Sidi-Belyout.

#### **COMMUNITY HIGHLIGHTS**

Part of the Wilaya of Greater Casablanca, the urban community of Sidi-Belyout (founded 1983), covers about 1,460 acres and its borders are:

- To the East: Boulevard de la Résistance.
- To the West: Boulevard Zerktouni and Ziraoui.
- To the South: Boulevards de la Résistance and Zerktouni.
- To the North: The Atlantic ocean.

According to the 1982 census, there are 169,425 urban residents. However, during the day, there is a large influx of people coming for job or commercial-related reasons or simply to visit.

This community is the headquarters of various public and private agencies or entities such as the Wilaya of Greater-Casablanca, the District Court, the Central Customs Office, Land Conservation, Stock Exchange, two road terminals, one railway-station, one municipal theater, 15 movie theaters, 380 private medical practices, 28 private medical clinics and the greatest and best restaurants in town.

It is contiguous with the first harbor of the Kingdom which is viewed specifically as the main impetus for community economic development and more generally as a means of advancement for the entire Kingdom since it handles 70% of Morocco's maritime traffic.

A review of Sidi Belyout economic characteristics and infrastructure will undoubtedly establish that this community plays a critical role in the economic and social progress of the City of Casablanca, both locally and nationally. In a way, it is a driving force for the economy, industrial and agricultural sectors alike.

Consequently, this community generates a considerable volume of garbage, i.e. 200 tons per day, to be collected and transported to the community landfill in the best possible manner. Thus, every household benefits from regular collection service all year round, except on May 1st, our Labor Day.

During the day of Aid Al-Adha, garbage is collected in the morning and in the afternoon because much garbage is generated on this holiday with the slaughtering of lambs.

A substantial fleet is dedicated to this service, i.e.:

- 16 compactor trucks,
- 3 trucks to empty dumpsters,
- 1 truck to empty compactor bins into dedicated spaces located in a transfer site and 5 small vans used to collect refuse in the narrow streets of the Old Médina.

In order not to impede traffic which is quite congested in the downtown area, collection activities start at 8:00 p.m.

The following human resources have been assigned to this municipal service: 84 street scrapers, 34 street cleaners for community markets and the street Prince Moulay-Abdellah dedicated to pedestrians, 114 street sweepers, plus 120 agents hired under the National Operation for Employment Development (O.N.P.E.) to reinforce the sweeping division and 36 drivers. This staff is supervised by 47 team leaders.

### **STREET SWEEPING**

This division sweeps about 130 miles of streets per day. All required equipment is available: carts, scoops, brooms, etc...

Swept garbage is hauled to various transfer sites then, it is loaded into dumpsters of about 280 cubic feet capacity ( $8m^3$ ) to be shipped to the landfill via pick-up trucks.

However, the sanitation service faces a few problems, i.e.:

- the public landfill is quite remote,
- transfer sites (garbage collection sites) are also quite remote,
- there is insufficient back-up manpower to cover for absentee workers.
- there is a lack of qualified manpower due to low wages for vehicle upkeep and maintenance.
- there is low personnel motivation as there is no employee bonus package,
- there is a lack of awareness among citizens and insufficient popular participation.

To solve these difficulties though, the following policies have been implemented in the municipality:

- In 1990, the city set up a mechanized garbage collection system, plastic containers were disseminated around town and this service has met widespread popular support.
- Awareness programs are periodically implemented in order to urge citizens to keep a cleaner city.
- Plastic and paper baskets have been placed throughout the city.
- A new repair shop will be built and operational very shortly.

The city is also considering using transfer sites and large trucks to curb collection costs and improve fleet maintenance.

These are the main traits and future prospects in the urban community of Sidi-Belyout. The City Council makes every effort to meet the needs of the citizenry focusing mainly on public services, i.e. upkeep of city parks, street lighting, roadways and garbage collection and this has exacted a heavy financial toll, both on personnel and equipment resources.

#### **C.G.E.A. STUDY**

Notwithstanding municipal efforts, garbage collection services have fallen short of expected results and therefore, in 1984, the Ministry of Interior has commissioned Compagnie Générale des Entreprises Automobiles (C.G.E.A.) to conduct studies in this field. With respect to the Sidi-Belyout community, this company has pointed out some operational and technical shortcomings and inadequacies. At the time, these observations were warranted and could be explained by the fact that the newly created community was streamlining its operations. But since then, technical departments and more specifically garbage collection services (still a central concern), have acquired adequate equipment.

Consequently, we decided not to cooperate with this company for the following reasons:

- Our town was a newly created community.
- Cost estimates were prohibitive.
- The community felt that such a cooperation program should be implemented at the Wilaya level.

**CURRENT ECONOMIC AND FINANCIAL ASPECTS OF GARBAGE COLLECTION SERVICES (1991)**

**SERVICE COSTS:**

- Use of fuel / Lubricants:	1,500,000.00
- Maintenance/ Spare parts:	700,000.00
- O.N.P.E. Personnel:	933,120.00
- Sanitation (mean salary):	5,430,360.00
- Drivers (mean salary):	662,688.00
	-----
<b><u>TOTAL</u></b>	<b>9,226,168.00</b>

- Equipment amortization:	4,000,000.00
- Miscellaneous equipment:	480,000.00
- Equipment for carts and dumpsters:	293,000.00
	-----
<b><u>TOTAL</u></b>	<b>4,773,000.00</b>

**- TOTAL SERVICE COSTS:**

	9,226,168.00
+	4,773,000.00
	-----
	13,999,168.00

- i.e. about: 14,000,000.00

- Yearly garbage production:  
365 x 200 = 73,000 tons

- Therefore, the cost of one collected ton of garbage is:  
14,000,000.00 : 73,000 tons = 191,78 DH/ton.

## **CONCLUSION:**

**This service is being financed by the Sidi-Belyout urban community itself, but privatization is not to be excluded in principle provided that this alternative does not cost more to the residents. Finally, we must point out that the landfill issue in Casablanca remains critical and it is a matter of urgency for Ministry and local community officials alike to find an appropriate solution in order to protect the environment, since giving the alarm is overdue.**

## **PRIVATIZATION OF SOLID WASTE COLLECTION**

**presented by**

**Mr. Ahmed Bel Baïta, Assistant Mayor of the city of Yacoub El Mansour, representing Mr. Belafrej, Mayor of the Yacoub El Mansour**

### **I) BACKGROUND**

The community of Yacoub El Mansour (pop. 220,000) extends over 9,620 acres. Urban occupancy is mostly R + 1 type, with a good mix of commercial and residential buildings in Hay El Fath, an industrial area. Main streets and access roads are for the most part covered with asphalt (80%). All roadways are accessible except narrow streets in the slums area.

### **II) GARBAGE COLLECTION AND DISPOSAL SERVICES IN THE COMMUNITY OF YACOUB EL MANSOUR**

Residential waste collection and disposal is a necessity both in daily life and for health reasons. This is a major task that is becoming more and more difficult to perform due to population growth and urban development.

#### **1) RESIDENTIAL WASTE VOLUMES AND COMPOSITION**

In the community, garbage volumes have increased from 104 tons/day in 1987 to 200 tons/day in 1991. i.e. 2 pounds/day/resident.

Monthly tonnage variations seem insignificant over the year, except for the week of Aid El Kebir, with a 30-40% increase in volume per day.

Residential waste breakdown (weight %) according to UTOM data, 1979:

- Organic matter	67%
- Glass	0.4%
- Rubber materials	2.6%
- Metals	1.4%
- Cardboard paper	19%
- Textiles	4%
- Debris-sand-topsoil	5.6%

To be noted: since 1979 waste cardboard volumes have decreased due possibly to sorting out prior to collection.

- Moisture content: 60 to 66%
- Density: 0.35
- Heating potential: 900 to 22,000 cal./pound.

## **2) PRE-COLLECTION ACTIVITIES**

Users place their waste on the curbside to be picked up by collection crews.

In most small communities, waste is placed in individual garbage cans and in large apartment buildings, caretakers or guards take the waste to public dumpsters.

## **III) RESIDENTIAL WASTE COLLECTION SERVICES**

### **1) WORK PLANNING**

The community of Yacoub El Mansour is divided into 19 districts serviced by 21 trucks, i.e. 1 truck per district plus two back-up units.

All waste is collected in the morning from 5:00 a.m. to 1:00 p.m. but on main streets collection is done at night with 2 trucks (1 truck assigned to the 3rd and to the 4th districts).

Waste is collected daily (even on holidays and on labor Day [May 1st] door-to-door except in the two slum areas (Hay El Kora and Hay Kouara) where garbage containers have been replaced by temporary dumpsters.

These dumpsters are emptied each day in one truck.

In the afternoon, once the work is over in the various districts, waste is then collected in the four community markets, one truck being assigned to each market.

### **2) EQUIPMENT IN USE**

Equipment used for collection and sanitation services is as follows:

- 6 "Ville de Paris"-type dump trucks (3.5 to 4 t. capacity)
- 15 construction-type trucks (4 to 5 t. capacity)
- 2 Renault 4 for managers
- 4 mopeds for supervisors
- 85 "Lutocars"

Daily truck mileage is about 53 miles (2 trips per truck).

### 3) PERSONNEL

Total staff for residential waste collection and sanitation services is as follows:

- 165 municipal employees
- 97 employees hired under the job promotion program (JPP)

Personnel	Municipal Employees	JPP	Total
Service Directors	2	—	—
Controlers	2	—	2
Managers & Foremen	7	7	14
Drivers	32	1	33
Collecters	56	40	96
Balers	60	49	109
Training Personnel	6	—	6
TOTAL	165	97	262

The following people are assigned per vehicle: 5 collectors, 1 full time driver, 1 back-up collector, 1 back-up driver

### IV) STREET CLEANING

Street cleaning is both necessary for health and aesthetic reasons. The community of Yacoub El Mansour does not have adequate human and technical resources to perform this task in its entirety. In fact, only 30% of public roadways (sometimes less) are being cleaned, mostly mainstreets and markets. Cleaning consists mainly of sweeping after waste collection. Every morning on roadways and every night in market areas. Sweeping is done with simple means: a broom, a scoop and a cart. When filled, the cart is emptied out in a collection truck.

## V) DISPOSAL

All collected garbage in Yacoub El Mansour is transported to a landfill located 14 miles away from Rabat near the Akrech river ("oued"). It should be noted that waste from the Rabat prefecture is also taken to this landfill. There are 3 vehicles and 10 crew members assigned to counting collection units and supervising offloading.

## VI) COLLECTION AND CLEANING COSTS

Annual average costs of all collection and cleaning activities is estimated at 5,660,000.00 DH, i.e. an annual average cost per resident of 28 DH).

### 1) OPERATING COSTS

#### - OPERATING COSTS

These include:

- personnel costs
- fuel and motor oil costs
- servicing and maintainance costs
- expenses for miscellaneous tools

#### - EQUIPMENT COSTS

These include vehicle and large equipment purchase prices.

#### - TOTAL COSTS

Total costs include equipment costs plus operating expenses. Various operational costs and total revenues are summarized in the following tables.

### 2) FUNDS FROM OPERATIONS

The sole revenues for collection services come from the municipal tax specified in the official bulletin dated 16-12-89 (Joumada 1, 1410), Title 2, tax and fees, Chapter one.

For the past 4 years, these revenues amounted to:

YEAR	1987	1988	1989	1990
Municipal Tax	3,277,950.7	6,312,978.0	5,214,394.2	10,737,641

### 3) DATA SHEET

This Sheet summarizes main data relating to residential waste collection and cleaning services.

YEAR	1987	1988	1989	1990	1991
Population	195,367	201,228	207,265	213,481	219,886
Garbage volume in kg/resident.	0.53	0.59	0.65	0.75	0.91
Number of vehicles	9	11	15	19	21
<b>Total costs/year</b>	4,310,930.1	4,670,272.1	4,878,221.6	7,144,391	9,786,852
Cost per resident/year	22.07	23.31	23.54	33.47	44.50
Cost per resident/day	0.06	0.06	0.06	0.09	0.12
Cost per 1 kg of garbage	0.11	0.11	0.10	0.12	0.13
<b>Personnel costs per year</b>	3,370,100	2,370,100	2,420,100	2,685,600	3,507,414
Cost per resident/year	12.13	11.78	11.68	17.58	15.91
Cost per resident/day	0.03	0.03	0.03	0.03	0.03
Cost per kg of garbage	0.06	0.05	0.05	0.05	0.05
<b>Equipment costs per year</b>	601,466.6	698,965.0	807,041.3	2,251,000	2,977,000
Cost per resident/year	3.08	3.47	3.89	10.54	13.54
Cost per resident/day	0.01	0.01	0.01	0.03	0.04
Cost per 1 kg of garbage	0.02	0.02	0.02	0.04	0.04

## SOLID WASTE COLLECTION

**TABLE NO. 1**  
**COST ESTIMATES**

Annual Capacity in Tons	Capacity. T/D	Materials	Personnel Salaries	Fuel	Oil	Repairs	Insurance	Equipment	TOTAL
37,960	104	120,000.00	2,370,100.00	887,618.34	112,379.20	260,000.00	79,366.00	481,466.6	4,310,930
43,435	119	129,990.60	2,370,100.00	889,464.08	160,535.00	463,500.00	87,708.00	568,974.4	4,670,272
48,180	132	189,049.75	2,420,100.00	939,284.35	160,535.00	592,485.00	119,311.00	617,991.5	4,878,221
58,787	161	320,000.00	2,685,600.00	1,220,904.10	184,875.00	634,256.00	167,756.00	2,021,000	7,144,391
73,000	200	220,000.00	3,507,413.92	2,067,278.90	187,155.00	799,855.27	248,149.00	2,757,000	9,786,852
261,362	716	889,040.35	13,353,313.92	6,004,549.77	805,479.20	2,750,096.27	702,290.00	6,446,433	30,790,667

- Average cost / year
- Average cost / year

6,158,135,00      DH  
28.00      DH

TABLE NO. 2

YEAR	ADMINISTRATION BUDGET			EQUIPMENT BUDGET		
	Municipal Budget for Administration	Portion for Solid Waste Services	Percentage for Solid Waste Services	Municipal Budget for Administration	Portion for Solid Waste Services	Percentage for Solid Waste Services
1987	21,148,348.00	3,829,463.54	18 %	36,348,143.00	481,466.60	1 %
1988	23,848,050.00	4,101,297.68	17 %	42,726,938.00	568,974.40	1 %
1989	28,758,300.00	4,420,765.10	15 %	55,901,254.00	617,991.52	1.10 %
1990	35,525,300.00	5,123,391.10	14.42 %	102,775,123.00	2,021,000.00	1.96 %
1991	38,769,600.00	7,029,852.09	18 %	113,052,635.00	2,757,000.00	2 %

## PRIVATIZATION EFFORTS

In 1984, a company from France -- CGEA -- offered to provide, on a trial basis, residential waste collection services in a district of Rabat bordered by the Atlantic ocean.

In a first phase, CGEA was planning to carry out extensive collection and sanitation activities in this district during several months to increase awareness about the need for a clean city. Consequently, a great number of trucks and other equipment would have to be stationed in the trial area to maximize operational cycles. When good cleaning habits were to be established, resources will then be reduced to their minimal levels to ensure normal collection activities. Excess equipment would then be transferred to other work areas.

Program implementation required a field study. The company sent a study team to follow up on collection activities and survey relevant municipal departments.

It was agreed that the company would conduct a preliminary study in two phases:

- to make a brief assessment in the district
- to propose an optimal solution

The first part of the study was conducted but not the second.

The company was to do the following:

- list and identify collection requirements (vehicles, maintenance shop and manpower)
- specify collection activities (type, schedule, frequency)
- provide a work schedule listing prior training in France for managers (Moroccan nationals)
- study and compare various alternatives to implement recommendations
- compute investment requirements
- specify corporate contributions for each alternative

Proposals would be made by taking into account existing resources (equipment, personnel and organizational structures) as much as possible.

The company proposed the following alternatives:

- to set up a private Moroccan company for street cleaning
- this company could collect residential waste provided certain contract terms were met.
- communities would provide the company with the required number of cleaners and sweepers at their own cost

- the company would pay for procurement costs, operational expenses, salaries for managers and qualified manpower (mechanics, drivers, etc...). Expenses would then be charged back to the community on the basis of a mutually agreed formula.

The creation of this company was to depend on the success of the pilot program which entailed buying numerous vehicles and outfitting a repair shop, Cost estimates were very high and donor-type financing (for example: World Bank) would have to be obtained.

In view of all these constraints and poor work ethics on the part of this company, project implementation became impossible.

# **THE COLLECTION OF SOLID WASTE IN CASABLANCA AND THE COMMERCIALIZATION OF COMPOST IN MOROCCO**

presented by

**Mr. Marcel Cadillon, Engineer at ANRED/GERSAR,  
Assistant to Mr. Bernard Fouilly, Manager of Internal Affairs, ANRED**

## **INTRODUCTION**

### **COOPERATION PROGRAM BETWEEN FRANCE AND MOROCCOON GARBAGE COLLECTION AND DISPOSAL SERVICES IN LOCAL COMMUNITIES**

Under a French-Moroccan cooperation program on local communities, various studies and experiments have been conducted in 1989, in order to:

- on the one hand, retrofit some compost-making facilities in Morocco, in view of the results to be expected from an adequate design;
- on the other, offer an extensive proposal of specific alternatives to implement a master plan for garbage collection and disposal in the Greater Casablanca area.

In the second half of the program specifically tailored to Casablanca, the intent was to:

- provide local communities of the Greater Casablanca Wilaya with various alternatives for a master plan relating to collection - processing - increasing garbage, debris and non-toxic industrial waste value;
- identify landfill technologies adapted to residential waste properties and various environments, test them in an experimental phase, assess their environmental impact, develop statements of work on the basis of the Casablanca case study;
- research potential use of composted garbage in the Casablanca area (market study) and if feasible, identify required capacity and processing technology for this compost-making project.

#### **A) RESIDENTIAL WASTE COLLECTION IN CASABLANCA - BACKGROUND**

Oftentimes, residential waste collection in Greater Casablanca is a very laborious daily activity while tonnage is skyrocketing (2,000 to 2,300 tons today, in 1989, versus 600 to 800 tons in 1977). Given this, the overall cleanliness of the city is very impressive indeed.

However, there are some exceptions to neatness and besides, the sheer size of related technical and financial resources, the required efficiency in complex services (which in fact lack actual technical support and adequate maintenance) are challenges that would support

joint support or incentive policies in a metropolitan area with 2,4 millions residents such as Casablanca.

Most communities and prefectures have been surveyed (interviews with mayors or general secretaries, heads of technical divisions or sanitation departments, repair shop directors or staff).

The purpose of the study was to outline coordinated policies to achieve better global technical results and cost-effectiveness for residential waste collection in various communities of the Greater Casablanca area.

To develop a series of measures or policies to be implemented in statements of work that would be specific enough to proceed to the next program phase, a most extensive review of various garbage collection parameters was necessary.

## B) RESIDENTIAL WASTE

### Volumes

There is no measurement of garbage collection and disposal volume per say as the Mediouna landfill, which was the only disposal site for residential garbage does not have a weighing station.

However, community surveys provide estimates of about 640 pounds of residential garbage per resident/ per year and this would seem close to actual numbers.

Consequently, it is estimated that 2,300 tons of residential waste is to be disposed of every day.

It must be pointed out that these generated volumes vary greatly from one community to another in the Wilaya, i.e. from 330 to 970 pounds per resident according to available data.

### Characteristics

The latest statistics breaking down residential waste by type in Casablanca date back to 1979 (Guigues Morocco).

This waste is mostly organic (about 70%) with a high moisture content (70%) and density (0,4 to 0,6).

These characteristics mean that:

- 1) garbage cans are very heavy and need to be emptied out by two crew members as one 18 gallon bin may weigh close to 80 pounds;
- 2) Compaction does not significantly reduce waste volumes in view of its high density, this technique is however not useless since garbage is at least pushed at the back of the truck.

### C) RESIDENTIAL WASTE COLLECTION

At first and until 1977, waste collection was provided by the technical services division of the city of Casablanca where population did not exceed 1,7 million. 2,500 employees (collection and sanitation services) and 184 vehicles (22 compactor trucks, 42 tipping trucks, 20 bins holders) were assigned to collect between 600 and 800 tons of garbage per day.

In 1977 and 1984 redistricting led to equipment sharing and to reorganizing all collection plans with all related difficulties that may be expected.

Since 1977, residential waste collection is provided by technical services divisions in each of the Greater Casablanca communities which are responsible for budget allocation and technical implementation. Each Casablancon community handles these tasks directly as a state-controlled operator.

Urban Community sanitation services (which also collect waste in poultry and cattle wholesale markets) dispose of the waste in the only landfill available, in Mediouna located 9 to 12 miles from the downtown area.

#### Pre-collection activities

They are carried out by residents who put their waste to be picked up in various containers: cardboard boxes, wicker baskets, plastic cans, buckets, half barrels with handles, etc...

#### Collection vehicles

Various types of equipment are in operation: dumpers, "Ville de Paris"-type of trucks, construction dumpsters, rolling and compactor bins. Capacities and efficiency rates vary greatly.

Equipment types and levels of sophistication also vary greatly from one community to another as indicated below:

## TYPES OF VEHICLES IN USE

COMMUNITY	Population 1988	total number of vehicles	compactor bins (%)	construction trucks (%)	leased trucks (%)	number of residents serviced per vehicle
ANFA	17 9861	33	42.4 %	18.2 %	0	5 450
SIDI BELYOUT	18 8623	29	58.6 %	3.4 %	0.0 %	6 504
MAARIF	194 820	16	43.8 %	18.8 %	0.0 %	12 176
MERS SULTAN	190 300	15	33.3 %	13.3 %	13.3 %	12 687
MECHOUAR	42 350	3	100.0 %	0.0 %	0.0 %	14 117
EL FIDA	317 350	17	64.7 %	17.6 %	0.0 %	18 668
BEN M'SICK	350 269	26	11.5 %	2.6 %	0.0 %	13 472
SIDI OTHMANE	368 998	15	33.3 %	60.0 %	0.0 %	24 600
SIDI MOUMEN	93 000	11	9.1 %	54.5 %	18.2 %	8 455
AIN SEBAA	88 000	16	37.5 %	31.3 %	18.8 %	5 500
ROCHES NOIRES	82 000	6	86.7 %	16.7 %	0.0 %	13 667
HAY MOHAMMEDI	174 000	7	57.1 %	0.0 %	0.0 %	24 857
SIDI EL BERNOUSSI	106 000	10	60.0 %	20.0 %	0.0 %	10 600
MOHAMMEDIA	150 000	17	70.6 %	0.0 %	0.0 %	8 824
AIN CHOCK	190 000	12	41.7 %	25.0 %	0.0 %	15 833
HAY HASSANI	171 000	24	25.0 %	12.5 %	0.0 %	7 125
<b>TOTAL</b>	<b>2 886 571</b>	<b>257</b>	<b>42.4 %</b>	<b>20.6 %</b>	<b>2.7 %</b>	<b>11 232</b>

(Source: community surveys)

Rationales for vehicle selection are many and difficult to substantiate. Equipment procurement decisions are made both on the basis on technical merit and cost-effectiveness.

In terms of collection efficiency, the best equipment is the compactor bin as garbage emptying is facilitated, loading and compaction is mechanized and collection speed is high.

Two main contractors operate in Morocco: Société SMV/Carrosserie Industrielle du Maroc and SOMAMA Corporation.

The main problem with this type of vehicle is maintenance and servicing. It is obvious that higher technical sophistication demand regular maintenance and better follow-up activities. However, it seems undeniable that generally, notwithstanding a few exceptions, technical services divisions do not have the means to follow-up and carry out minimal maintenance.

In many cases, economics prevail over sound technical choices. In fact, capital investments are financed on budget surpluses.

However, operating budgets are generally insufficient and these investments become difficult, even impossible to make. In such a predicament, communities tend to prefer the cheapest equipment even if capabilities are less adequate.

Faced with scarce capital or equipment, some communities choose to lease trucks to a lesser or broader degree. This alternative meets short-term service delivery requirements but does not solve the issue satisfactorily in the medium and in the long term.

### **Staff**

In general, garbage collection crews consist of one driver and 4 working crew members. The high number of employees per vehicle is necessary in view of the weight which may reach about 80 pounds per garbage can.

Core personnel (drivers, crew members, sweepers) consists of workers with various employment status:

- permanent employees,
- laborers paid on a piece basis,
- workers hired under the national job employment program.

A staff review in various Wilaya communities indicates great discrepancies in personnel ratios; as an example, the number of residents serviced per crew member ranges from 1,835 to 6,285, whereas the number of collected tons per crew member varies from 521 to 2,868 (normal and optimal figures being at the lower end of the scale).

Besides significant differences in collection staff numbers, an overall lack of motivation is to be noted due to inadequate manpower, laborious and unpleasant working conditions and also poor benefits and wages.

### **Equipment maintenance**

Equipment maintenance is vital if communities are to carry out collection activities in proper conditions. Indeed, equipment which is poorly or badly maintained or serviced can

not operate properly nor last very long. In various discussions, we have noticed very significant shortcomings in this area. In most cases, there is hardly any follow-up activity for vehicle maintenance, fuel use or mileage.

Communities suffer from very poor infrastructure. Most of them do not have enough (or have no) covered area to park vehicles and sometimes they do not have hard-surfaced roads (tar or cement). Most repair shops we visited do not have the required equipment to provide minimal vehicle maintenance, not to mention servicing.

Oftentimes, communities can not afford enough repair personnel and, moreover, because of low wages they are hard-pressed to find qualified personnel, whereas truck maintenance and servicing demand extensive and specific technical skills: sheet-workers, mechanics, solderers, electricians, electromechanics, hydraulics experts...

Vehicle maintenance is one of the major problems shared by almost every community in the Greater Casablanca area.

#### D) COLLECTION COSTS

One general statement from field surveys is that few communities perform regular cost analysis to separate garbage collection costs from other expenses and compute various ratios. However, six communities have been reviewed on the basis of their accounting data in this study. These results are summarized as follows:

#### UNIT COSTS OF GARBAGE COLLECTION SERVICES IN SOME CASABLANCA COMMUNITIES

	HAY MOHAMMEDI	EL FIDA	SIDI OTHMAN	SIDI BERNOUSSI	BEN M'SICK 1987	H
POPULATION	174,000	317,350	369,000	106,000	350,940	
WASTE TONNAGE PER YEAR kg/res./year	41,132 236	131,400 414	56,210 152	46,720 440	93,940 268	
PERSONNEL COSTS	1 177 315	2 238 000	2 219 467	475 200	1 969 607	1
DIESEL	330 718	1 120 000	814 830	899 000	496 520	
SERVICING	51 314	20% 1 030 000	14% 488 558	18% 340 000	20% 644 802	35%
LEASING	35	520 000		27% 169 772		
TOTAL	1 559 348	4 908 000	3 522 855	1 873 972	3 110 929	2
COST PER TON	37,91	37,35	62,70 Dh/t	40,11	33,10 Dh/t	
COST PER RESIDENT	8,96	15,46	9,54	17,67	8,86	

(Source: community surveys)

\*This data must be analyzed with great care and it would be preferable to use it as an indicator or for comparison purposes. Resident or ton ratios give rise to significant uncertainties as to assessment methods used in these two reference parameters. Furthermore, these figures do not include amortization costs.

**Given these reservations, it is estimated that the cost of one collected ton of residential waste may vary between 33.10 to 62.70 dirhams, i.e. 8.86 to 17.67 dirhams per resident.**

These figures corroborate the central issue of equipment management and maintenance. Finally, one may venture to say that in order to provide ideal and efficient services, i.e. to collect community waste in its entirety, finance amortization and equipment costs for maintenance, collection costs should range between 80 to 100 dirhams per ton.

In theory, garbage collection services costs are "covered" by a municipal tax equal to 10% of housing leasing value. This specification tax allocation to collection services should permit self-financing. However, on a per resident basis, tax revenues vary significantly from one community to another: from 16,09 Dh in AIN CHOCK to 85,29 Dh in Sidi Belyout. On a per ton basis, it would finance cost collections equal respectively to 58,80 Dh and 217,08Dh in the same tow communities.

Assuming that these municipal revenues are entirely used up by collection services and on the basis of the costs mentioned above, it would seem that these services could be fully financed. Yet, facts to the contrary, which we can not substantiate any further, would lead us to assume that, in fact, communities face such budget constraints that they use this municipal tax for purposes other than garbage collection services.

#### **GENERAL CONCLUSIONS AND PROPOSED STRATEGY TO IMPLEMENT A MASTER PLAN FOR IMPROVED GARBAGE COLLECTION SERVICES IN COMMUNITIES OF THE GREATER CASABLANCA WILAYA REGION**

In most communities of the greater Casablanca area, residential waste collection services seem to be in a dire predicament. Only a few with adequate financial or technical resources are able to provide satisfactory service.

Indeed, such difficulties seem indeed due to a set of factors. However, one central problem must be emphasized as it feeds a "vicious circle": inadequate equipment results for the most part from inadequate maintenance.

In fact at all times, 20 to 30% of the equipment is non operational, and sometimes, this figure is higher in some communities as repair shops are poorly outfitted.

Three factors seem to come into play:

- investments in repair shop equipment are difficult to make,
- there is a lack of qualified and full-time mechanics due in part to low wages.
- community redistricting has created repair shops of too small a size to be profitable in communities which are more management than technology-oriented.

Disabled equipment brings on overuse and premature wear of operational units thereby accelerating the rate of equipment failure.

As far as selection of collection equipment is concerned, great diversity in types and brands complicates operations and maintenance. Furthermore, FEC may finance collection units which are not in compliance with communities requests. In any case, sound equipment selection on the basis of standard criteria for all parties involved would greatly contribute to developing national policies and streamline equipment choices in communities.

Keeping these difficulties in mind, streamlining of available resources and structures is lacking, thereby leaving considerable latitude to increase service efficiency. Furthermore, this strategy calls for implementing management and follow-up criteria on a cost accounting basis.

A weighing station in the landfill is a basic necessity.

From a more technical and organizational standpoint, it could be appropriate to set up one or two transfer sites for garbage collection in Casablanca,. While some communities located south of the city are only 4 to 5 miles from the Medionna landfill, others are more than 18 miles from it, i.e. 1 hour away considering detours and traffic jam. Furthermore, development projects in suburban and coastal areas will put these residents farther away from landfill sites. The basic advantages of one or more transfer sites for Casablanca would obviously be transportation savings but mainly less equipment wear and consequently greater equipment availability for its original purpose, collection and finally, better landfill management as a limited number of large trucks would be coming in.

Finally, as far as the financial status of communities is concerned, and that obviously determines equipment and service delivery quality, resources are very unevenly distributed and many communities do not have enough surpluses to invest in equipment or servicing tools. These investments are made "a posteriori" and could suffer from cutbacks on subsidies from the Ministry of Internal Affairs or on loans from FEC.

Current unit costs (per ton or per resident) which we have been able to compute (all reservations included) vary greatly and range from 30 to 70 Dh/t or from 9 to 18 Dh/resident, exclusive of amortization. In effect, 35% of these costs relate to maintenance/servicing/leasing. To upgrade the service, the cost would have to reach 100 Dh/t or 40 to 50 Dh/resident.

It must also be pointed out that this data available only in a few communities clearly illustrates analytical, technical and financial deficiencies in most municipal collection services.

The basic financial issues (i.e. financing for garbage collection services, reason for scarce capital and how to budget costs such as outlined above for equipment upgrading and self-financing) call for mitigated answers as the subject matter is complex and extreme caution must be exercised in interpreting available data.

In fact, it seems that the municipal tax slated for garbage collection services could in theory provide "ideal financing" such as outlined above, but it must be said that all other municipal services also demand financing and use up part of these revenues. In global terms and in view of scarce resources, priorities or trade-offs must be identified to respond to multiple emergencies.

However, if priorities for garbage collection were clearly established (and such is the case in numerous communities), it should then be possible, in theory, to allocate a specific budget to residential waste collection services. In any case, it would be vital to thoroughly study garbage collection costs under the current system and under an upgraded approach and to ensure adequate budgeting.

After all, under a coordinated master plan for garbage collection services in Casablanca, a series of policies should be implemented to meet two following basic goals:

- to provide optimal conditions for equipment use by way of operational maintenance, possible development of a transfer site and sound investment choices;
- to operate equipment under optimized management policies by way of management follow-up and training activities, cost control and securing of adequate financial resources.

#### PRESENTATION OF ACTION STEPS FOR THE IMPROVEMENT OF SOLID WASTE COLLECTION IN CASABLANCA

Action items and objectives under a master plan to improve collection activities in Casablanca

In view of the preceding appraisal, we would recommend additional studies to implement the master plan.

There is a need to better understand technical and cost information pertaining to collection services, to pool technical assistance resources, maintenance and servicing capabilities, to optimize transportation routes to the landfill, to audit collection services and implement adequate employee benefit packages.

### 1) GENERATING RELIABLE DATA FOR FOLLOW-UP ACTIVITIES AND EFFICIENT MANAGEMENT

<ul style="list-style-type: none"> <li>• Policies</li> </ul>	<ul style="list-style-type: none"> <li>• Weight</li> </ul>	Construction of a weighing station at the landfill
<ul style="list-style-type: none"> <li>• Data gathering</li> </ul>	<ul style="list-style-type: none"> <li>• Individual time sheets, mileage</li> <li>• Fuel use</li> </ul>	Data sheets for follow-up developed by back-up unit
<ul style="list-style-type: none"> <li>• Data management (inter and intra-community), processing and analyzing</li> </ul>		Setting up a back-up unit
<ul style="list-style-type: none"> <li>• Advice and technical assistance</li> </ul>		Setting up a back-up unit

### 2) EQUIPMENT MANAGEMENT AND MAINTENANCE

<ul style="list-style-type: none"> <li>• Great disparity in and inadequacy of technical means</li> </ul>	<div style="border: 1px solid black; padding: 5px;"> <p><b>Study of collection vehicles potential needs both quantitatively and qualitatively</b></p> </div>
<ul style="list-style-type: none"> <li>• Optimize/standardize equipment selection criteria</li> </ul>	<ul style="list-style-type: none"> <li>• Back-up unit acts as an advisor</li> <li>• Development of standard criteria for FEC assistance</li> </ul>
<ul style="list-style-type: none"> <li>• To improve maintenance, need to streamline and pool maintenance capabilities</li> </ul>	Study of maintenance techniques

### 3) PERSONNEL TRAINING AND MOTIVATION

<ul style="list-style-type: none"> <li>• Promote garbage collection as a rewarding activity</li> </ul>	
<ul style="list-style-type: none"> <li>• Develop training tailored to each position in collection services</li> </ul>	Outreach activities (design included) for back-up unit
<ul style="list-style-type: none"> <li>• Promote motivation and efficiency at work (service image, bonuses, financial incentives...)</li> </ul>	

#### 4) TRIPS TO LANDFILL

- |   |   |
|---|---|
| <ul style="list-style-type: none"><li>• Minimize the number of short trips and use vehicles for their main purpose: collection</li><li>• Increase equipment and personnel availability</li><li>• Alleviate landfill congestion and eliminate wasting time</li><li>• Minimize staining</li></ul> | <p>Review to optimize transportation logistics toward a, or several, disposal sites</p> |
|---|---|

#### 5) REVIEW OF COMMUNITY FINANCIAL MANAGEMENT POLICIES

- |   |  |
|---|--|
| <ul style="list-style-type: none"><li>• Great potential with adequate financial means</li><li>• Allocation of required and adequate resources to cover costs (operation and investments)</li><li>• Follow-up analysis of financial management policies in garbage collection services</li></ul> | <ul style="list-style-type: none"><li>• Audit of service financing and management policies (jointly with review of potential collection needs)</li><li>• Follow-up carried out by back-up unit under DCL supervision</li></ul> |
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## DISCUSSION FOLLOWING THE PRESENTATIONS

presented by

PERREAULT, LASKI, BEL BAÏTA, CADILLON AND FOULLY

### QUESTION

MR. DRISSI (TETOUAN)

I simply want to make it clear that the cost of composting would become affordable if we used the mud produced in the treatment plants.

### ANSWER

MR. CADILLON

I believe that it is inadvisable to mix the mud from the treatment plants with household garbage which, by the way, is damp. This would increase the humidity and make sifting difficult.

### QUESTION

MR. DONOVAN

Could you indicate the necessary investments by the private sector?

### ANSWER

MR. LASKI

I had actually said that the partner would be led to invest more and that by investing more, the cost would increase. Consequently, in the formulae we are considering, we must agree on a starting price in relation to the existing and future investments; these would have to be revised in the case of a supplementary investment to improve the service. Thus, this is a cost which is not fixed from beginning to end. It is a function of the partners' investments.

## QUESTION

MR. HIROUF (C.U.C)

Should we not put more stress on the organizational element? You spoke of the segmentation of the sector between the municipalities and the Urban Community. Since the latter is in charge of the garbage dump and the municipalities located on the upstream circuit, I think that this situation is prejudicial insofar as it takes away motivation from these two parties who are not in perfect harmony. As everyone knows, the Moroccan local communities are governed by the Municipal Charter -- to my mind, an avant-garde charter which makes it possible to greatly overhaul an activity while the municipal function is performed. With respect to the Casablanca experience, and in this preliminary phase of a possible privatization, there is cause to reexamine this sector either by putting the dumps at the disposal of the municipalities -- which is impossible since the sector is bound to be municipal -- or by having certain municipal prerogatives transferred between the councils and the urban community by common agreement. In the framework of budget control, I had the opportunity to visit the dump and I noticed that there was no control, namely no control of transportation (a truck can come to the landfill half empty) and that, in any case, the chain is broken between the municipalities and urban community. Therefore, I think that, before optimizing or making a fundamental option, there is cause to reconsider the organizational aspects; the only cost would be votes or taking a stand which would be slightly political insofar as the municipalities are jealous of this prerogative. But as the Urban Community is made up of the community council members, I think that we would be doing this chain a favor and this would allow enormous gains.

At present, the Urban Community is thinking of installing weighbridges to check the flow of waste; therefore, these are fits and starts measures which should be made clearer within the Casablanca Urban Community Council.

Thank you.

## ANSWER

MR. LASKI

In fact, the problems raised by MR. HIROUF are real problems, and we should find a solution which would not break the chain from the user to the landfill. Personally, I do not think that the solution lies in the community, not because of an excessive jealousy of the attributions of the municipalities, but because, as everyone knows, the more a government takes care of monstrous things such as waste collection in Casablanca, the more there are lapses on the collection level; thus, it is better not to create an organization which would be responsible for the whole community or to appeal to a single contractor and trust him with this task. I think and am convinced that we should call on a certain number of contractors who would be responsible for a section of the city, thus avoiding the total paralysis which could be generated by a single system. A single organization can be in charge of the sanitary landfill or composting for the whole community.

MR. FOULLY

I would like to clear up a few points. The organization problem certainly is a key question. What is the decentralization and distribution level of the various functions? This is the major question facing us. The first step is decentralization -- obviously with everybody's assent -- as a result of taking responsibility for a whole department, which would boil down to each municipality procuring its own equipment, providing its own transportation, and having its own landfill. In the course of our first investigations in Casablanca, we found out that there were a few landfills and what the question was; what can be done for the municipalities if each one wants its own landfill? At present, the municipalities' perception has evolved as a result of having to realize a single landfill which would be sufficiently well organized. This landfill example can be used with the other municipal functions. Is each municipality capable of managing all the functions of its household waste disposal service? I think that transportation can be examined from a community point of view with all the advantages it includes. Therefore, what good would it do to transfer 2 000 metric tons a day? A functional productive transfer center can handle up to 500 to 600 metric tons. It would not be a burden to manage given the fact that we will have about four transfer centers. A private or municipal organization can manage these centers efficiently. We can also address the question of garages: can all municipalities succeed in procuring a garage for themselves? This cannot come about tomorrow. Therefore, we can ask whether we should provide a certain integration, and at what level? And who would be in charge of the management?



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## **PRIVATIZATION OF SOLID WASTE SERVICES: A PRACTICAL VIEW**

**presented by**

**Mr. Robert J. Donovan, Engineer and Director of Solid Waste Services,  
city of Phoenix, Arizona, United States of America**

As I prepared to write this paper I realized that I was about to present views that were totally within the framework of my own personal experience. Perhaps that in itself is not a "bad" thing to do. However, it will not provide the reader with all the information required to make the most informed decision possible. In an effort to provide a more useful tool I have branched out of my own personal experience and offer some possible privatization options, that have been used in other areas, which should be perfectly applicable to the solid waste arena.

Before exploring what options which for privatization and what specific information a public sector entity should consider prior to making a privatization decision and entering negotiations with a private firm, I would like to set some ground rules which I think are critical to optimizing the potential success of such a venture. Listed below are those issues that should be considered as "critical success factors":

- a.) The public sector entity must have a solid waste management long-range strategy. This plan should include collection service options and disposal options. These areas must be reviewed in light of the current waste composition and generation rates. Growth in generation and changes in composition must be forecast. Based on generation and composition information, options such as waste to energy, recycling and composting programs should be considered. The direction of environmental legislation must be kept in mind when developing this plan.
- b.) The public entity must have an established service level and a finite idea of the customer base.
- c.) The public entity should optimize the public provision of the service to the highest productivity level possible at the lowest cost. Baseline cost comparisons, for the purpose of calculating savings, will generally be made against the current cost of providing the service. If the public entity has not fine tuned its own system it cannot maximize the potential savings gained from a privatization initiative.

Certainly anyone can argue that there should be other factors included in the list. However, this is a short list of the most salient of the many factors that will impact on the long term success or failure of a privatization initiative.

Within the context of privatization, a public entity has at least three major options or choices it can make in how they privatize:

- a.) The most common alternative for privatization is normally a contract. In this case, the public entity contracts with a private firm to deliver all, or a portion, of a public service. When contracting, the government defines the service level, the quality of the service desired and pays the contractor directly. Contracting is a commonly used method of privatization for a multitude of services. Its major limitations lie with the number of available service providers and the ability of public entities to define the services required. A key issue with the contracting option is the availability of multiple and qualified private service providers. Contracting in a non-competitive environment is a high-risk scenario. As mentioned in critical factors, service levels must be clearly defined and understood by all. A change in service level, during a contract term, can be very costly.
- b.) Another choice might be to create a franchise concession. Although I have had no personal experience with franchises in the solid waste area, they have worked in the privatization of other municipal services. In a franchise concession, the local government awards exclusive or nonexclusive rights to private firms to deliver a public service within a certain geographic region. The service provider bills the service recipient directly for the service provided. I am aware of a major California city that has entered into a franchise type agreement with a waste collection company. Since they have no control over the revenue stream, they have very little resultant control over the service provider. I see this as a major problem with this type of arrangement.
- c.) A third choice might be to develop a contract with subsidies. In this type of arrangement, the public entity provides subsidies, either financial or in the form of in-kind contributions, to reduce contract costs and, ultimately, costs to the consumer. The public entity could provide maintenance facilities or other physical plant, equipment, etc., to reduce the contractor's capital investment or operating cost and hence the near-term contract costs. Fixed-plant types of contributions, since they may have already been paid for by the public entity, make a very attractive subsidy, if you will, and can substantially reduce contract costs.

Making the assumption that the conditions outlined in the critical success factors section have been met, and a privatization mechanism is being considered, several issues must be addressed. The first question that arises concerns the legal framework provided for the privatization of public services. Nations, state and local laws might deny or limit a public entity's options in this area. I would recommend that staff or contract legal counsel be obtained and the following questions be answered:

- a.) Can the public entity legally privatize solid waste services, and under what conditions can this occur? In some cases, a public referendum on this issue might be required, or the term of the privatization period might be limited.
- b.) Can any or all of the options, such as contracting, franchising and subsidies be considered in the contracting decision?

- c.) Are there limits to the types of tender criteria that the privatization initiative must meet? I would consider that the Request For Proposal format might be the best format to utilize in a contracting initiative. This format allows the public entity to negotiate a best and final offer with the proposers of their choice.
- d.) Are there limits, or is there a structure, for tendering the initial privatization initiative? As I found in Bolivia, an outside firm was required, by law, to handle the process.
- e.) What are labor's rights, if any, by law in a privatization initiative?
- f.) What legal challenges could be mounted, by special interest groups, which could sabotage or defeat the process?

A serious legal problem would negate any immediate need to consider privatization until enabling legislation was provided or legal barriers were overcome.

The next issue that should be reviewed is "Should the entire service be privatized?" In light of the question regarding the public entity providing the service at the lowest possible cost, this issue bears some scrutiny. If the public entity provides collection service to a large enough customer base and/or operates multiple disposal facilities, then the question of the public/private competitive environment can be explored. Divide the service into two roughly equal areas and let the public entity compete against private sector bidders. The chances are, as occurred in Phoenix, Arizona, the public entity will lose at least the first few bids. As the public sector management team and labor force, in the other half of the entity, observe what has happened, they will tighten up their operation in an attempt to become more competitive. The lowest cost for service provision and the maximum productivity level can thus be achieved.

After the public entity has determined whether to provide all or part of the service, a serious effort must be made to determine exact levels of service being provided. It is impossible to develop a good bid document or contract if exact service level requirements cannot be provided. Equally important is the consideration that maximum savings, from a privatization process, cannot be obtained without a clear definition of service level and costs. I have listed below several key service-level questions that should be reviewed prior to going further with a privatization process:

- a.) In the area of collection of solid waste, is every party that should be receiving service actually being served?
- b.) Is the frequency of the collection service adequate, inadequate or too high? Many public entities provide too high a service frequency based on their generation rate. This is extremely costly, and while contracting the same service level may be incrementally less costly, it does not optimize potential savings.
- c.) Has the long-range plan been followed in terms of disposal options?
- d.) Have disposal options other than landfilling been considered on a cost basis?
- e.) Are the landfill and/or other disposal options being operated at an optimum level? Landfill operating hours might be excessive based on generation rate or on artificial barriers such as a perception that the public should have seven-day-week access?

The above are representative of the types of service level questions that should be answered. The list is not intended to be all-inclusive, and additional questions, based on local considerations, should be reviewed.

After a clear definition of service levels has been achieved, the operation must be scrutinized from the standpoint of cost. What does the provision of the service, identified for privatization, cost? At this point I will introduce the concept of "go-away costs". Go-away costs are defined as costs the public entity will not have to pay as a result of privatization. A simpler way of looking at go-away costs might be to call them direct costs. However, if the term "direct costs" is used, we will immediately enter into a discussion of what should be considered a direct cost. Let me provide an example. Assuming we have decided to privatize our collection operation, using the contract option, the argument can be made that part of the direct cost of providing that service is the cost of a maintenance facility for the vehicles used for collections. If the maintenance facility is used exclusively for collection equipment, and can be sold or shut down to achieve a savings, I would agree. If, however, the facility is shared with other elements and remains open and functional then only the "go-away", or reduction in operating costs, should be looked at as a savings. There is no savings in capital amortization, possibly no savings in building maintenance cost, etc. Shifting overhead costs to other departments has saved nothing and is an accounting function at best. Some go-away costs are relatively easy to identify, therefore equipment operators that will not be required, maintenance of equipment and direct supervision. Other go-away costs are harder to identify. What reduction in support staff should be accomplished based on a reduction in the workforce? If a personnel/payroll clerk is no longer required, then that is a go-away cost. If a mid-manager stays on but achieves a reduction in responsibility, or a change in responsibility, but no reduction in pay, I would argue that is not a go-away cost. If an honest comparative number is to be developed it must be accomplished by an outside audit force, or at least be monitored by an outside audit force. There is considerable pressure on the organization being privatized to develop an unrealistically low figure as a comparative number. Its survival is at stake.

Once a comparative cost figure is available, the next logical step is preparation for a privatization initiative should center on the question: "how do we pay the contractor?" if we are discussing a bid situation. If we are interested in the franchising option, we must look at the limits we will impose on the contractor in terms of how the contractor collects revenue. Assuming the legal framework is in place and all privatization options are available to us, let's look at the contracting option first. In every privatization initiative there is a natural adversarial tendency to try to keep a contractor's revenue to a minimum. While certainly this is important, it is equally important to remember that, while the public entity should save money, it should not constrain profit to the point where the contractor cannot provide the service level required and ultimately fails. When a contractor fails, everyone suffers, and the future of other privatization initiatives is put at great risk. With that in mind, we can discuss forms of payment. Normally, two forms of payment are utilized in collection contracts, and two forms in transfer station and landfill contracts. In the collection contract, we have the choice of paying per collection unit or paying per ton collected. In selecting either choice, it is very obvious that good historical data regarding

unit growth and/or tonnage growth will allow for a solid projection of contract life costs. With little or no unit growth or tonnage growth, data on total contract life costs will be suspect.

In the collection area, which is better? Should you select payment by unit, or payment by the ton? All things being equal, I would recommend payment by the collection unit, as it is much easier to monitor. However, if accurate historical unit data are not available, it is much easier to develop short-term tonnage history, and this makes payment by the ton an attractive option. Payment by the ton has some consequences, however. Contractors have been known to water down loads to increase tonnage. This will occur as a natural phenomenon in areas where there is a high annual rainfall. It is not unusual for a lot of dirt or rock to find themselves in loads when tonnage is the payment criteria of choice. Wet garbage and other contaminants are more difficult to monitor due to the fact that they can occur as a natural part of the waste stream.

In the case of landfill or transfer stations contracts, payment is usually either by the ton or by the cubic yard. Tonnage and cubic yards are the fundamental criteria that determine solid waste transportation and disposal costs. In making a selection I would recommend a per-ton method be used. Per-ton is easier to measure consistently. It becomes a true indicator of the transportation cost, when gross vehicle weight laws are in effect. The cubic yard payment, at the landfill, allows a private hauler to deliver more tonnage based on the truck's compaction capability. However, it is difficult to estimate partial loads and, generally, a hauler is charged for the full load the truck is capable of carrying. Obviously the overcharge for a partial load will be passed on to the consumer. As wet garbage allows for more compaction, there is an incentive to water loads. As discussed previously, this is a problem when collection contracts are paid on a per-ton basis.

When franchising the operation, you normally allow the organization which holds the franchise to determine the payment methodology. I would recommend that the payment method and rate caps be included in the franchise agreement. Capping rates may in effect reduce the attractiveness of the franchise. However, it can mitigate the problem of soaring costs for the consumer if the franchise option is chosen.

After all of the issues addressed above have been reviewed, privatization tendering can be considered. The ultimate goal of this tendering will be to generate a contract of some sort. At this point, several issues become very important. Addressed below are the most critical issues I see:

- a.) Who should be a player in the privatization arena? Based on the size and complexity of the operation, we should want to limit the choice of partners to those who can perform the service based on technical competence, experience and financial strength. The tender offer should be structured to qualify only those companies that can make the project work.
- b.) A process, such as an invitation to bid (IFB) or a request for proposal (RFP), must be selected. As stated previously, for a first contract, the RFP process or a similar mechanism which allows for a negotiated best and final offer scenario would be the preferred method.

- c.) Based on the specific situation, a timeline for the process must be developed. In this case, more time is better. If a potential partner has plenty of time to get on site and look at the situation, he can sharpen his pencils. Time allows the bidder to become comfortable with the accuracy of his cost estimates. If a bidder does not have enough time, he will estimate high, in most cases, rather than make a mistake.
- d.) Allow time in the process to resolve and political situations that might arise as a result of the initiative. What does the public think? Is public relations a problem? Make the public aware of what to expect the cutover from public to private service. Prepare them for the possibility of a few missed collections. Advise them that their collection truck might not arrive at the time it used to arrive.
- e.) Allow time, afterward, for the contractor to order equipment, if required, and get it on the ground. Allow time to phase the contractor in gradually. Do not attempt to do a one-day cutover from public service to private.
- f.) Spend adequate time to define the service clearly and the service level required.
- g.) If legally possible, allow for a meeting, after the bidding document is on the street and potential privatization partners have had a chance to review it, so that questions can be asked and answered. All qualified bidders should be required to attend this meeting. Any potential service provider who is not present should be eliminated from the process at this point. This should be made clear in the bidding instructions. Any potential problem areas can be resolved, with an addendum to the bid document, after this meeting.
- h.) The bid document should be a basis for design of the final contract. It can, in fact, be the final contract, if the process is so designed.
- i.) Potential privatization partners require free access to all information regarding service levels and service provision methodology that can be made available to them. This will allow them to develop the best possible service provision plan at their lowest possible cost. Remember, they will try to develop a lowest-cost scenario if that is one of the bid selection criteria.
- j.) Information provided should not include the public entity's cost for providing the service. I do not believe that I have to dwell on the reason for this. If it is at all legally possible, this information should be kept a closely guarded secret.
- k.) Develop the selection criteria matrix at the same time you develop the bid document, and share it with the potential service providers. Bid submissions should be structured in accordance with the selection criteria in order to facilitate the evaluation process.
- l.) Penalties for non-performance should be clearly articulated in the bid document. Methodologies for computation of penalties and payment methodologies must be clearly stated. This is required for contract monitoring and mutual understanding by all parties.
- m.) Price adjustments during the contract term should be outlined. A contractor should understand what the criteria are for gaining a price adjustment. Adjustments may be

based on normal cost adjustments, extraordinary adjustments for increases in commodities such as fuel, or requested service changes.

n.) If an outside agency is required for bid evaluation, it should be technically competent in the area of solid waste operations.

As a final issue, the question of whether tax incentives and funding of private investment should be considered in the privatization of solid waste arena. Clearly, this question is more related to the issue of economic development than it is to the area of privatization. Privatization by its very nature indicates an effort, on the part of the public sector, to grow. However, without a clear understanding of the mix of taxes and financing that support other infrastructure service areas, one cannot take solid waste privatization, as a stand-alone issue, and determine whether tax incentives and financial incentives would be positive or negative. These issues can be addressed with a degree of rationality only if the public entity has a long-range financial plan and has considered various options for tax incentives and other financial incentives in the greater context of its public finance structure.

This paper provides an outline, for a public entity considering privatization its solid waste operation, to use as a starting point in developing a plan which will result in a successful privatization process. I must stress the importance of developing a realistic service level, understanding the applicable legal constraints and knowing the cost of the operation in maximizing the potential savings from any privatization effort. Public relations cannot be overlooked in gaining both popular and political support for the process.

## **A STUDY OF SOLID WASTE: GENERAL OBSERVATIONS**

**presented by**

**Mr. Frank B. Ohnesorgen, Senior Urban Advisor, ICMA, United States of America**

The municipality of Tetouan has requested that USAID Morocco provide assistance to furnish the services of a solid waste management expert to assist the Public Works Department to prepare a management analysis of solid waste collection and landfill management services provided by the City of Tetouan. The results of this activity will establish the analytical background to permit development of a privatization plan for the solid waste collection and disposal services currently provided by the municipality.

Existing solid waste services in Tetouan are not efficient or effective and lack environmental soundness. Approximately 35 percent of the daily solid waste generated is not collected. The municipality is plagued with open illegal dumping and littering. Tetouan lacks funds to maintain its collection fleet properly and to purchase much needed additional and special collection equipment to properly service the Medina and unplanned neighborhoods.

Environmentally sound disposal of collected solid waste is lacking. The present landfill is presently contaminating the environment--air, water, and surrounding land.

Although the solid waste section is under the administration of a very capable engineer, it lacks capable middle managers and frontline supervisors to assist in the technical and administrative operations of the organization. Records are virtually non-existent, budgets, revenues and expenditures are prepared by a central authority so that it is impossible to compute accurate costs and analyze operations. The organization is suffering from low moral due to lack of safety and work environment health protection. There are no service fees collected for solid waste services and consequently the section operates at an increasing deficit.

In order to improve the present solid waste management system, the consultant recommended:

1. That the solid waste section be reorganized into a division by itself in order to allow it to prepare and administer its own budget, control its own personnel, control its own equipment maintenance and establish records to allow it to set up a fee structure for residential and commercial/industrial customers. Generation of its own revenues could eventually allow this section to become a self-funding enterprise.

2. That a landfill site be identified and acquired as soon as possible. Planning, designing and developing a new landfill requires an extensive amount of time and the present site is an environmental hazard.
3. That a public relations and education campaign be launched and aggressively pursued by all top level governmental officials to change the citizens' attitude about indiscriminate solid waste disposal and its effect on public health.
4. That good effective legislation be adopted, supported politically, and enforced to give the municipality control of the waste being generated.
5. That more funds be allocated to implement these major recommendations.

The consultants also recommended that Tetouan should seriously consider privatizing at least one-third of the city's collection area. (The central downtown and commercial section.) This would allow the city to get an outside perspective on what it costs to provide collection services seven days per week. It would also free about one-third of its collection employees and equipment which could be used to provide service to those areas not presently being served. Additionally, privatization would create jobs and provide for effective comparison between the municipality's delivery of service and that of the private sector.

The City's landfill should also be considered for privatization. This would free city funds for other uses instead of having them allocated for land purchase, landfill equipment purchases and landfill operations. This could also create private sector jobs, especially if the private landfill operator is required to recycle and make compost.

I believe that this project has a high potential for success for the following reasons:

1. There is strong political will especially by the mayor, public works director and director of solid waste. (We have found from studies in other countries that if the mayor does not support a project, the project will not get done.)
2. The Director of Solid Waste, Mr. Drissi is looking at this project as a systematic approach. (A systematic approach is when you see the entire picture.) He is not just looking at solid waste collection. He is looking at street sweeping, street washing, land-filling, recycling, education, regulations and enforcement as an integrated solid waste management system.
3. Mr. Drissi is also looking at the need for specialized equipment, in particular to clean and collect waste in the Medina. This is very important because usually a lot of managers order equipment before they understand the needs of special areas.

In Summary, one thing I would also recommend based on lessons we have learned from other countries, is whether you are providing too much collection service. When you collect waste 7 days a week, your costs for equipment and manpower are tremendously high. And usually this is not efficient because you are collecting very little waste for your operating costs. This is an area that can be remedied by a good education and regulatory campaigns.

**The best approach to dealing with solid waste management is to be flexible and to develop a system that is adaptable to change as a city grows and economic develops and to approach the problem as a total integrated waste management system..**

## **METHODS OF PRIVATIZING SOLID WASTE COLLECTION: FEASIBILITY STUDIES**

presented by

**Mr. Abdelhak Drissi, Director of Environmental Services,  
city of Tetouan, representing Mr. Ahmed Agzoul, Mayor of Tetouan**

### **A. INTRODUCTION:**

The city of Tétouan is experiencing a serious problem with regard to the cleaning up of solid waste, as is evidenced by the present conditions (see the summary of the present situation in Annex 1) and it exists in spite of the efforts which have been approved in this area.

Since 1984, the Municipality has continually worked to improve this public service. A number of actions have been taken in this area, especially:

- The constant renovation of the vehicle fleet;
- The increase in human means;
- The reorganization of the department;
- etc..

These actions have made it possible to maintain this public service at an acceptable level. But they alone cannot provide a proper remedy to the ills which plague the service.

Therefore, it was decided to conduct the necessary studies to seek a management system which would perform better than the one in effect until the present time.

The participation of the Municipality of Tétouan in this seminar will consist of reporting:

- The principal results of the studies which have either been concluded or are in progress;
- The methodologies which could be used to conduct certain preliminary studies.

### **B. PRELIMINARY STUDIES:**

Following a preliminary study<sup>1</sup> conducted in collaboration with USAID, the partial privatization of the Solid Waste Collection Service was proposed. (However, other methods of management would not be eliminated.)

<sup>1</sup> Bibliography No. 2

"A Guide to the Privatization of Public Services"<sup>2</sup>, set up by ICMA, suggests that the contractual process must take place in six (6) stages:

- A feasibility study;
- An analysis of the costs of the contract;
- The preparation of bids and contract document files;
- The selection process;
- Negotiations and adjudication;
- Management and follow-up of the contract.

As a rule, and independently of the recommended management system, the preliminary studies would have to end in the elaboration of a local policy regarding solid waste purification management. This policy would establish the technical, institutional, and environmental objectives (both quantitative as well as qualitative) to be reached.

More particularly, in connection with the topic of this Seminar, the preliminary studies would supply the elements necessary to set up the bids and contract documents file.

The main preliminary studies to be undertaken are:

- \* The analysis of the Solid Waste Collection Service;
- \* A financial analysis
- \* An institutional analysis;
- \* An impact study.

The Tétouan Municipality, in collaboration with USAID plans to conduct these studies in the very near future. As a matter of fact, the analysis of the Solid Waste Collection is in progress.

#### **I. ANALYSIS OF THE SOLID WASTE COLLECTION SERVICE:**

The purpose of this study is to analyze the activity of a Solid Waste Collection Service aiming at:

- Dividing this activity into its components;
- Estimating the costs of the service;
- Establishing the base plans for the operations of the Solid Waste Collection Service;
- And finally , establishing an evaluation and control system for the provisions of this particular service.

#### **I.1. DESCRIPTION OF THE OPERATIONS OF SOLID WASTE COLLECTION:**

<sup>22</sup> Bibliography No. 2

Actually, the purpose is to analyze the activity of a Solid Waste Collection Service so that its activity can be divided into its components.

This is interesting because:

- The reference terms (or technical clauses) to be elaborated by the Government would be clearer;
- The consequence of the first point is that the offers the Government would receive would be more homogeneous,

thus making it easier to evaluate and compare them;

- The component operations can be taken as the basis for the payment of the provision of services or for the calculation of the services rendered;
- And finally, these component operations would serve to establish the organizational structures of the Solid Waste Collection Service to be implemented.

#### 1.1.1. TYPE OF OPERATION:(<sup>1</sup>)

A quick analysis will show that the principal operations conducted by a Solid Waste Collection Service are:

- Sweeping public streets;
- Washing public streets;
- Emptying and maintaining the trash cans;
- Cleaning the markets;
- Collecting the refuse;
- Waste Disposal and Removal.

The tasks enumerated above are the base operations of any Collection Service. It can also be responsible for other operations said to be "special", such as:

- Picking up and disposing of tree pruning products;
- Cleaning of empty lots;
- Picking up debris and clumps of dirt left on public streets;
- Cleaning the posters and paintings;
- Cleaning the beaches;
- Cleaning the parks;
- Picking up dead animals;
- Picking up bulky objects and abandoned vehicles on public streets;
- Etc..

## 1.1.2. DEFINITION OF THE OPERATIONS AND APPLICATION:

### a. Sweeping:

Independently of its method, the sweeping operation includes the cleaning, pick-up and disposal in the public garbage dump (or sanitary landfill) of all and any refuse on the roadways, sidewalks, or other sections of the street subject to this operation.

The waste to be swept includes:

- The waste resulting from pedestrian or vehicular traffic;
- The spills of household trash collection;
- Tree leaves;
- Animal excrements;
- And, any object or debris left on the public street which could be removed through sweeping.

The waste disposal will preferably be done through the household trash collection system.

The various sweeping methods are:

- Manual sweeping;
- Mechanical sweeping;
- Both manual and mechanical sweeping;
- Maintenance sweeping.

The choice of what sweeping method should be used would depend on:

- The advantages and limitations of each one;
- The possibilities and characteristics of the zones to be swept, especially:
  - \* the width
  - \* parking of vehicles
  - \* type and quality of the ground coating;
  - \* density of pedestrian and vehicular traffic;
  - \* hills;
  - \* density and social category of the population (neighborhood urban classification : residential, tourist appeal, commercial, industrial, etc.);
  - \* etc..

b. Washing:

As a complementary operation of or in combination with sweeping, the washing of public streets is used in the following cases:

- To move toward the sidewalk borders the debris subject to sweeping located under parked vehicles;
- To thoroughly clean the roadways and sidewalks so as to rid them of dust, dirt, stuck debris or stains.

Whether or not detergent is added to the wash water will depend on the type of waste to be eliminated.

Washing can be implemented with a greater or lesser frequency:

- On streets with a high pedestrian or vehicular traffic;
- In the markets and surrounding areas;
- In downtown Medina;
- On streets supporting fixed parking;
- As well as in any place which is of particular interest or could be considered harmful with regard to public health.

The methods of washing are:

- Mechanical washing;
- Both mechanical and manual washing.

The choice of washing method would depend on:

- The advantages and limitations of each one;
- The characteristics of the sites to be treated such as:
  - \*The nature and condition of the roadway coating;
  - \* The level of the roadways and sidewalks in relation to the neighboring buildings;
  - \* The type of parking;
  - \* Etc..

c. Emptying and maintenance of the trash cans:

This operation consists of the implementation of the following tasks:

- Emptying the trash cans with the necessary frequency, which can be performed by sweeping teams whenever necessary;
- Cleaning the trash cans and putting them back;
- Repairing and replacing the damaged trash cans.

d. Cleaning of the markets:

The markets will be cleaned every day at the time of closing, and will consist of sweeping-washing, as these operations were previously defined.

e. Collection of household garbage:

As a rule, household garbage collection is effected in two stages:

- Pre-collection;
- And collection proper.

e.1. Pre-collection or display of the waste:

The pre-collection can be implemented with two containers of a greater or lesser capacity for the purpose of solid waste disposal by the population.

More detailed studies, which would take into account the specifications of the town in question, of the socio-economic and urban characteristics of the zones to be serviced as well other criteria (characteristics of the refuse, quality/cost ratio) would have to determine:

- The technical characteristics of the containers;
- The selection of a place for the containers;
- The number of containers in each location;
- The distance between two locations;
- The scheduling of when to place and remove the containers.

Should it not be possible to place containers, zones with definite boundaries and adequate signs on the ground would have to be reserved for the deposit of solid waste by the population.

e.2. Collection:

The collection of the waste will be done with the help of vehicles designed for this purpose.

The choice of the collection method, its degree of mechanization, and of the vehicles would be made in accordance with the characteristics of the zone to be serviced.

Fixed routes would have to be defined for each vehicle (or collection team.)

The preceding has defined a Solid Waste Collection Service operations.

The same thing can be done for each special operation which is a part of the Solid Waste Collection Service.

This chapter has not dealt with waste removal because this topic needs to be discussed separately.

## **I.2. PLANS FOR WASTE COLLECTION:**

After having divided the city into homogeneous zones, and on the basis of the operations defined above, the following would have to be established:

- A plan for street cleaning;
- A plan for collection of household trash;
- A plan for special operations.

For each of these plans and for each zone, the following elements must be defined:

- The type of operation;
- The human and material means reserved for this operation;
- The frequency;
- The scheduling;

- THE ROUTING; OR SITES SUBJECT TO THIS OPERATION.

## **II. FINANCIAL ANALYSIS:**

The purpose is to estimate the cost of the operations connected to the Solid Waste Collection Service in order to:

- Estimate the cost of Collection plans;
- Be used as a reference for the evaluation of financial offers;
- To furnish the decision makers with the information they require to select which operations would be privatized and which would be managed by the State.

The estimate of these costs demands a complete financial analysis of the expenses of a Solid Waste Collection Service.

The "ICMA<sup>(1)</sup> Privatization Guide" proposes a methodology for estimating public service costs which can be summarized thus as follows:

This methodology consists of:

- a.- Making a detailed description of the services rendered; such as that in the "Analysis of the Solid Waste Collection Service," top;
- b.- Making an inventory of the necessary resources to provide these services (see table # 1 -- Annex 2.)
- c.- Establishing the costs of the services;

Four types of costs must be established:

### c.1. Internal Costs

The purpose is to establish the present costs of the services provided by the Government.

In order to do so, it is sufficient to estimate the expenses of the resources necessary to provide the services, making sure to account for the indirect expenses, i.e. the part of this particular Service in the resource expenditures which do not directly affect them.

Tables 1, 2, 3, 4, 5, 6, and 7 in Annex 2 give an idea of the manner in which this cost is figured.

### c.2. Avoided Costs or " Achieved Savings":

Actually, the purpose is to evaluate the savings which can be generated by contracting out a public service.

The following example will be useful in giving a better explanation of this notion:

If, after a service has been privatized, the Government staff affected to this service is transferred to the contractor, the resulting savings include among others the personnel management costs.

It certainly is not always easy to identify the positions which would enable the Government to realize savings from the privatization of a service. However if at the time the internal costs have been established the identification and evaluation of the resources have been done accurately, then it is sufficient to add the costs of the resources which are no longer necessary due to the privatization in order to determine the amount of the savings thus realized.

### c.3. Unit Costs

The calculation of the unit costs is always useful for either quick estimates or the payment of the services provided.

### c.4. Contract Cost:

Having identified and described the services, it is necessary to proceed to an informal consultation with a few companies which supply these services in order to conduct a study of the contract cost.

## III. MANAGEMENT AND FOLLOW-UP OF THE CONTRACT:

The success of any management method depends on its evaluation and control system.

A control system includes an evaluation system and a sanctions scheme.

### III.1 - EVALUATION SYSTEM

Any control system which seeks to be effective needs a good collection and information analysis. The information needed by this system can come from four main sources:

- The contractor's daily reports;
- The field reports;
- The field observations;
- The beneficiaries' complaints

#### III.1.1.- CONTRACTOR'S DAILY REPORTS:

It is necessary to demand that the contractor submit either a copy of the daily reports drawn up to enable him to check on his own management, or a daily report on the operations implemented according to a predetermined format and agreed upon by both parties.

Particular attention should be paid to these reports because they are documentary evidence that the contractor has been paid. The mass of information contained in this type of report and its frequency necessarily demands computerization. It is advisable to demand that the contractor set up a data processing system of the information contained in the daily reports to which the Government agents would have access in order to minimize the latter's control cost.

#### III.1.2.- FIELD OBSERVATIONS:

The Government would have to create a control structure in the field in order to:

- check the veracity of the daily reports;
- measure or evaluate certain parameters which would make it possible to give information on the quality and quantity of the services provided by the contractor;
- make sure that certain norms are achieved (work, safety, health, etc.)

Sworn agents, experienced or trained in solid waste purification, would have to be responsible for this control.

Designing the forms to be filled out by these agents for each type of control would make it easier to collect the data and would make this information homogeneous.

#### III.1.3.- BENEFICIARIES' COMPLAINTS:

The Government would have to pay particular attention to the beneficiaries' complaints because, in the end, the latter's satisfaction is the ultimate goal.

In order to determine the weaknesses of the services rendered, it would be necessary to -- in addition to analyzing these complaints -- follow up on the response given to the latter so that the complainant's degree of satisfaction and the response time (speed of reaction) could be determined.

Investigating sample groups would be another way to determine the beneficiaries' degree of satisfaction.

### **III.2 - SANCTIONS SCHEME:**

The sanctions scheme consists of:

- defining what is considered to be a mistake;
- making an inventory of these mistakes;
- classifying these mistakes according to their gravity with regard to:
  - \* their importance;
  - \* their impact on the service rendered;
- determining the penalties for each mistake or category of mistakes;
- defining the methods of writing the reports of offenses;
- defining the methods of applying the penalties.

### **IV. INSTITUTIONAL ANALYSIS:**

The institutional analysis aims at defining the management method and the adequate organizational structures of the activity in question.

On the judicial plane, there does not exist any limitation in the choice of management or organization methods of public services.

According to the King's decree (Dahir) No. 1-76-583, dated 09/30/76, on municipal organization, the law maker has allowed the local communities to use all possible management methods:

- state control;
- self management;
- concession;
- joint corporation.

#### **IV.1 - STATE CONTROL:**

State control remains the most widespread method of public services management.

This management method, which was valid as long as the services volume of activity was not very large, is more and more critical.

It is possible to improve this management method by the institution of a supplementary budget. Management by supplementary budget, while allowing for a certain autonomy of services, can be a preparatory stage to other management methods.

#### **IV.2 - SELF MANAGEMENT:**

The creation of autonomous municipal control is regulated by decree No.2.64.394, dated 09/29/64.

Municipal control may be the management method best suited to a public service. Because while allowing a commercial (private) management type, its main objective is not profit, as is the case in a private company.

Local communities sometimes avoid the creation of self-management corporations for fear of not retaining any control over these corporations once they have been created. Drawing up a list of responsibilities, clearly defining the relations between the municipalities and the corporation can dispel this fear.

#### **IV.3 - CONCESSION:**

The municipality can grant the operation of a public service to an organization (whether for profit or not) -- viz. urban transportation.

The concession can be total or partial:

- concession on the entire or part of the waste collection service on all or part of the municipality's geographic area.
- The agent can limit himself to the operation of the service or can be in charge of both the operation and equipment of this service.
- Etc..

The scope, the nature of the concession and the agent's salary must be defined in the contract documents.

#### **IV.4 - JOINT CORPORATIONS**

The local communities can create joint corporations (or participate in existing corporations) to manage a public service.

Actually, the purpose is to entrust the management of this service to a corporation in which the municipality owns stock.

The advantage of this formula over the concession is that the municipality can intervene (therefore exercise control) in the management of this type of corporation. The degree of control depends on the number of shares held by the local community. It is estimated that with 1/3 participation, the municipality ensures its control over the joint corporation.<sup>3</sup>

<sup>31</sup> Bibliography No. 5

Ministry of Morocco  
 Ministry of the Interior  
 Province of Tetouan  
 Municipality of Tetouan

SOLID WASTE SERVICES

SITUATION IN 1991

GEOGRAPHIC AREA				VEHICLES		HUMAN RESOURCES				QUANTITY OF SOLID WASTE			RATIOS								
No. sec	Sectionsec.	Surface total	Surface const.	Popula- lon	House holds	Density	Type	No.	Perm. staff.	Temp. staff	Total	Bais.	Effec. total	Collect. T/J	Prod. T/J	Collect %	R1 AG/HA	R2 AG/HA	R3 AG/HA	R4 Men'AG	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	
1	Médina	47	30	37984	8479	802	PROM.	6	22	47	69	10	79	18	19	95	1,67	2,29	480,8	107,3	
2	Centre	56	22	16818	3569	298	C.B.T.	2	12	7	19	40	59	12	13	95	1,05	0,87	285,1	60,49	
3	Dersa	84	38	50461	9432	604	CROM	1	9	2	11	1	12	6	25	24	1,14	0,29	4205	786	
4	S. Malaga	86	34	42177	7893	490	CRS CROM	1 1	9	9	18	5	23	8	21	38	0,17	0,53	1834	343,2	
5	S. S. Driss	499	32	38120	6622	76	CRE CBE	1 1	11	10	21	2	23	7	19	37	0,05	0,66	1657	287,9	
6	Touta M'H.	165	25	27758	4925	169	CBT CBE	1 1	7	13	20	4	24	10	14	72	0,15	0,79	1157	205,2	
7	Touar. To.	634	73	83240	14178	131	CBT	4	26	25	51	11	62	20	42	48	0,1	0,7	1343	228,7	
OTHER SECTIONS							CMR	3													
REPLACEMENT VEHICLES							CBT	2		144	144	27	171	45							
							CMR	1													
							PROM	2													
							DUMPER	1													
GRAND TOTAL		1571	254	296558	55098	189		28	96	257	353	100	453	126	148	85	0,29	1,39	654,7	121,6	

## B I B L I O G R A P H Y

- 1) Solid Waste Management.  
Service Study.  
T é t o u a n  
Morocco  
  
June 10-22, 1991  
By: Frank B. Ohenesorgen.  
ICMA International urban adviser.
- 2) Contracting and Volunteerism in Local Government  
A Self-Help Guide.  
ICMA International.
- 3) Pliego de condiciones para la pretestation del servicio de  
limpeza publica varia y recogida domiciloria de basuras.  
Municipalié de Sebta.  
July 1990.
- 4) Law and Management of Public Companies in Morocco.  
by Driss Alaoui Mdaghri.
5. Market Survey of Solid Waste Management (09/10-28/90).  
Port-au-Prince, Haiti.  
Wash Field Report No. 319  
USAID  
  
February 1991.

**ANNEX 1**  
**SITUATION OF THE**  
**SOLID WASTE COLLECTION SERVICE**  
**TETOUAN**  
**1991**

**SOLID WASTE COLLECTION**

**1991 SITUATION**

**LEGEND TABLE**

COLUMN No.	MEANING
1	• Sector No.
2	• Sector designation
3	• Total area
4	• Built up area
5	• Population (projection 1992)
6	• Number of households (projection 1992)
7	• Total area/population
8	• Vehicle type (see meaning of abbreviations)
9	• Vehicle number
10	• Permanent workers, household waste
11	• Occasional workers, household waste
12	• Total workers, household waste
13	• Permanent workers, sweeping
14	• Occasional workers, sweeping
15	• Total workers, sweeping
16	• Total personnel/sectors
17	• Daily average of collected household waste (obtained by scale operators)
18	• Potential production of household waste obtained by multiplying the population by 0.5kg except for the downtown area (where the population is multiplied by 0.75 due to the presence of cafes and restaurants)
19	• Output
20	• Total sector personnel/total sector area
21	• Household waste/built up area ratio
22	• Population/total personnel by sector ratio
23	• Household number/total personnel by sector

OBSERVATION	MEANING
P.B.O.M.	Peugeot dump truck, household waste
C.M.B.	• Multi-bin dump truck
C.B.T.	• Truck equipped with a packing bin
C.B.E.	• Contractor dump truck
O.M.	• Household waste

**ANNEX-2**  
**FORMS FOR THE CALCULATION OF THE COSTS OF**  
**THE SOLID WASTE COLLECTION SERVICE**

**ANNEX-2 Table I**

Closed List of a Service Needs in Resources

**Personnel: (Occasional and Temporary)**  
-----

Salaries

- managers
- subordinate personnel (operations)
- ancillary office staff and support personnel
- seasonal and temporary labor
- overtime
- other expenses

Benefits Premiums

- Insurance
- Clothing and safety equipment
- Training
- Miscellaneous

**Equipment and Supplies:**

**Supplies:**

**Maintenance**

- services
- office
- materials
- miscellaneous

**Equipment:**

- technical equipment
- office furniture
- computer hardware
- miscellaneous

**Equipment**

- fuel
- lubricant
- repair
- miscellaneous

**Facilities: (amortized)**

- Initial capital
- Insurance
- Maintenance
- Miscellaneous

**Miscellaneous:**

Division Chiefs - elected  
Budget/Finance department  
Planning

-----  
Source: "Contracting and Volunteerism in Local Government" ICMA

**Annex-2 Table 2**

Distribution of Direct and Indirect Resources Costs

<b><u>RESOURCES</u></b>	<b><u>DIRECT</u></b>	<b><u>INDIRECT</u></b>
Personnel	salary overtime benefits insurance clothing miscellaneous	salary or expenditure for - security - control
Equipment and Supplies Equipment Purchase	maintenance supplies insurance	
Facilities		initial capital insurance maintenance
Miscellaneous		billing disbursement service insurance

Source: "Contracting and Volunteerism in Local Government" ICMA

**Annex-2 Table 3**

**PERSONNEL COST**

Salary:	- Permanent
	- Temporary
Additional Disbursement:	- Overtime
	- Miscellaneous
Benefit premiums:	- Clothing ...
Control and Supervision:	- Salaries
	- Benefits
Pensions	
Miscellaneous	
Subtotal:	-----
Personnel total:	-----

Source: "Contracting and Volunteerism in Local Government" ICMA

**Annex-2Table 4**

**COST OF EQUIPMENT AND SUPPLIES**

<b>Type of Cost and Source</b>	<b>Direct</b>	<b>Indirect</b>
Equipment Capital:	- Miscellaneous Capital - Repayment of Loans (Principal and Interest)	
Equipment and Maintenance:	- Repairs and Maintenance - Equipment and Supplies - Equipment Insurance	
Purchasing Department		
Other Equipment and Supplies Costs		
Subtotal		
Total Equipment and Supplies		

Source: "Contracting and Volunteerism in Local Government" ICMA

Annex-2 Table 5

COSTS OF THE FACILITIES

Type of Costs and Sources	Direct	Indirect
Initial Investment:	- Land - Buildings - Development	
Services:	- Heating - Electricity - Telephone - Water - Other	
Building Insurance		
Building Maintenance	- Security - Repairs/Maintenance - Grounds - Other	
Subtotal:		
Total Services:		

Source: "Contracting and Volunteerism in Local Government" ICMA

**Annex-2Table 6**

MISCELLANEOUS COSTS

Type of Cost and Source	Direct	Indirect
-------------------------	--------	----------

Subtotal:

Total-Miscellaneous:

Source: "Contracting and Volunteerism in Local Government" ICMA

**Annex -2 Table 7**

**SUMMARY OF THE PROJECTED INTERNAL COSTS**

DIRECT	INDIRECT	TOTAL
PERSONNEL (TABLE 3)		
EQUIPMENT AND SUPPLIES (TABLE 4)		
SERVICE (TABLE 5)		
MISCELLANEOUS (TABLE 6)		
TOTAL COSTS:		

Source: "Contracting and Volunteerism in Local Government" ICMA

## SOLID WASTE CONTRACT MONITORING

presented by

**Mr. Robert J. Donovan, Engineer and Director of Solid Waste Services, Phoenix, Arizona, United States of America**

Solid waste contract monitoring can be defined as that body of responsibility and actions required to endure the effective delivery of the specified service within the legal and financial confines dictated by a contract. If this definition is acceptable, then there are three areas which bear close scrutiny:

- 1.) Specifying the service to be delivered
- 2.) The legal framework in which the contract is entered
- 3.) Financial considerations

In addition, it will be worthwhile to dwell on a monitoring organization.

I have attempted to prepare a practical overview of what is required to monitor a solid waste contract. This is only an overview as there are many varied considerations related to contract monitoring issues which are dependent upon that type of service being privatized and the type of privatization mechanism chosen. Clearly, a franchise mechanism, where a contractor collects the revenue, will require different emphasis from a contract where the public entity pays the contractor. Likewise, a landfill contract will require different monitoring steps from a collection or transfer station contract. I will attempt to discuss each option briefly in addition to covering issues which are common to all.

Before we move into some of the more technical areas of the contract monitoring function I believe it is important to talk about the issue of protection, which contract monitoring should provide from the most fundamental standpoint. When a public sector entity privatized through some counteracting or other mechanism, it is generally charting unknown territory. The contract monitoring function is viewed as a major portion of the safety net that ensures that the privatization process goes well and the public entity and the service recipients receive the service to which they are entitled.

I would point out that protection of the contractor is also an important consideration of the contract monitoring function. No one wins if the contractor cannot provide the service and make a profit. Therefore, it is very important that the contractor not be required to perform work which is not clearly defined in the contract, due to pressure from the service recipient. Let me provide an example. In Phoenix Arizona we require that all refuse containers be placed at the curb by six a.m. on the designated day of collection. Due to factors beyond his control no operations manager can endure that a truck will always be at a certain place at exactly the same time. Traffic, truck breakdowns and the amount of

refuse placed out for collection make this impossible. Trucks are routed to pass all collection points at some point during the day. If a resident places a container out after the truck passes it will cost about \$3.00 a mile to move a collection vehicle back to that point and make the collection. This does not account for the driver's costs, which are time-dependent. Clearly, residents must be trained and exceptions made. However, a contractor cannot economically operate if everyone placed refuse out for collection whenever it was convenient. The contract monitoring function must protect the contractor from abuses for the good of the system.

Privatization should always provide a net positive for the solid waste system in terms of cost and service level. Just as a public entity may choose to privatize, to increase service level and reduce cost, it may wish to regain control of the solid waste function to effect positive change. If private sector service providers have become sloppy and costly in terms of providing the solid waste service, then the public sector may elect to bid on the service itself, in a competitive environment, or take control without a bid. In light of the above, one of the first monitoring issues I would consider is a cost analysis of contract cost versus internal cost. Public entities which have contracted for service over long periods of time, tend to take contract cost increases as a matter of course. Price fixing among private service providers is not unheard of. In order to avoid this trap, a public entity should estimate its cost to provide service against its contract costs sufficiently in advance to provide the service itself when contract renewal is imminent.

Fundamental to any contract monitoring function's success is the early development of a contract which sets forth a clear definition of the service to be provided. This should include the who, what, when, where, and how the service will be provided. Fundamental issues such as requirements for provision of emergency service in times of disaster should be clearly spelled out. How the contractor will respond to labor disruptions, civil strife or "acts of God" should be explored and defined in the contract. Any questions contractors have regarding their responsibilities should be handled in a "pre-bid" meeting. A pre-bid meeting allows all contractors the opportunity to ask questions related to the tender document. All bidders should be required to be present at such a meeting to ensure a uniform approach to bid response. It is very important that the legal issues, related to the prosperity of holding such meetings, be carefully reviewed prior to entering the privatization tendering process.

The importance of clearly defining the nature of the service to be provided cannot be overstated. In my experience public entities and the service recipient often have different views of the service being provided and of the level of service being rendered. It is not unusual for the public entity to attempt to increase the service level or the geographic area being provided a service as a desired result of the contracting process. In an effort to mitigate any problems which might result from any of the above situations, certain steps should be taken as follows:

- a.) Prior to a privatization process a survey should be taken which seeks to define the service recipients view of the adequacy of the current service delivery system.
- b.) Based on the survey results any changes in the system should be reviewed in terms of the cost benefit ratio derived for the majority of the population receiving service.

- c.) Any geographic increase in service area should be technically reviewed in terms of the challenges which must be met to provide the service and service provisions should realistically be costed to determine the likely cost to the service provider. These increased costs should then be added to the public sectors financial analysis to determine an acceptable bid.

The lesson to be learned here is that the difficulty related to monitoring a contract can be substantially reduced if a clear understanding exists among all parties regarding the exact nature of the service to be provided.

A very important contract issue, which has a major impact on the contract monitoring function, relates to the arbitration mechanism which should be designed into every document for purpose of expediting dispute resolution. It is unrealistic to assume that every conceivable issue related to the performance of a long term solid waste contract could be foreseen in advance and adequately addressed in the contract document. Some examples might be useful:

- a.) Public demand for a new type of service, such as recycling curbside pickup.
- b.) An oil crisis which requires a contract price adjustment.
- c.) The institution of a new holiday
- d.) A new public event which requires refuse service.

Although a good contract would foresee these possibilities it would require an arbitration mechanism, to determine exact contract adjustments required and the appropriate cost adjustments. In most jurisdictions at least some laws have been enacted which deal with refuse handling. The contract monitoring function should be available to provide interpretation and/or enforcement.

I have now broached the subject of enforcement. This is a topic that bears some scrutiny. It would be impossible to ensure that all provisions of a solid waste contract, regardless of the type, would be carried out unless an enforcement mechanism, of some sort, was in place. The only alternative would be to declare one or both parties in default and terminate the contract. Default is costly and a time consuming procedure which I hope no one experiences. Short of this the contract should specify specific penalties to be applied in cases where contract terms are not met. Penalties should apply to the contractor for not delivering service as well as to the contracting party for not meeting their responsibilities under the contract. Repeated failure to comply with contract terms should result in default. Penalty and default terminology should be clearly spelled out in the contract document. Again, applicable legal structure will guide the public entity in their individual handling of penalties and default.

Part of the contract monitoring function, which can clearly become a separate legal issue, relates to liability for the contractors actions. Liability may be one of the most serious single issues related to the contracting process. Let me give a worst case example, a contractor's truck runs over a private car and kills the occupant. Who has liability and in what amount? Liability issues can be so costly that they require a full understanding before

the contract should be entered into. In some jurisdictions the contractor might have sole liability, in others the contracting entity might bear all or a portion and in other cases the contract language might be the determining factor. Certainly this area should be carefully explored prior to entering into a contract and in cases where contract interpretation is an issue the contract monitoring function must be involved in interpretation of the relevant language for the protection of the public entity.

Now that we have some understanding of the issues involved with the contract monitoring function lets explore the possible establishment of such an agency. This first area to be considered are the legal dictates involved in the contracting apparatus in a certain jurisdiction. Some possible contract monitoring functions might be set up as follows:

- a.) The contract monitoring function might itself be contracted to a private agency.
- b.) An existing public agency might be tasked with the requirement.
- c.) A separate agency might be established, within the public entity, to carry out the function.

In some jurisdictions the existing legal framework will dictate which option is used. In others, a choice might be available. Whatever choice is made the cost of the contract monitoring function must be added to the contracting cost to determine the actual cost savings, which should come with privatization.

A second question we might ask is "what should a contract monitoring agency, for a solid waste contract, look like?" Clearly any organization must have an agency head, whatever we might call the person. It might be argued that this person should be an attorney with a background in contract law it might also be argued that this person should be a solid waste professional with contract experience or even just a contract agent with no specific solid waste experience. At this point I would like to digress a minute and put to rest a myth that has existed beyond its time. The solid waste management profession has gone far beyond the old stereotype of putting garbage into a truck, hauling it off and dumping it into a hole in the ground. Legal constraints, environmental issues and technology have taken the profession well beyond those days. I would argue that anyone managing such a function should be thoroughly knowledgeable regarding the current state of solid waste management.

Clearly contract monitoring is a fertile field for the legal profession. No solid waste contracting monitoring agency could function effectively without sound legal guidance. This could be accomplished by hiring legal counsel on staff, contracting for the function or using existing public legal counsel. The choice made here should largely depend on the size of the contract or contracts and the willingness to wait for legal information. If large contracts are involved and considerable dollars are at stake I would argue that having a contract attorney on staff would be the preferred alternative. This might sound like an expense that is not required if you are trying to save money via privatization. However, the contractor will also have retained legal counsel or have a staff attorney and all or part of this person's costs will be included in the contractor's bid.

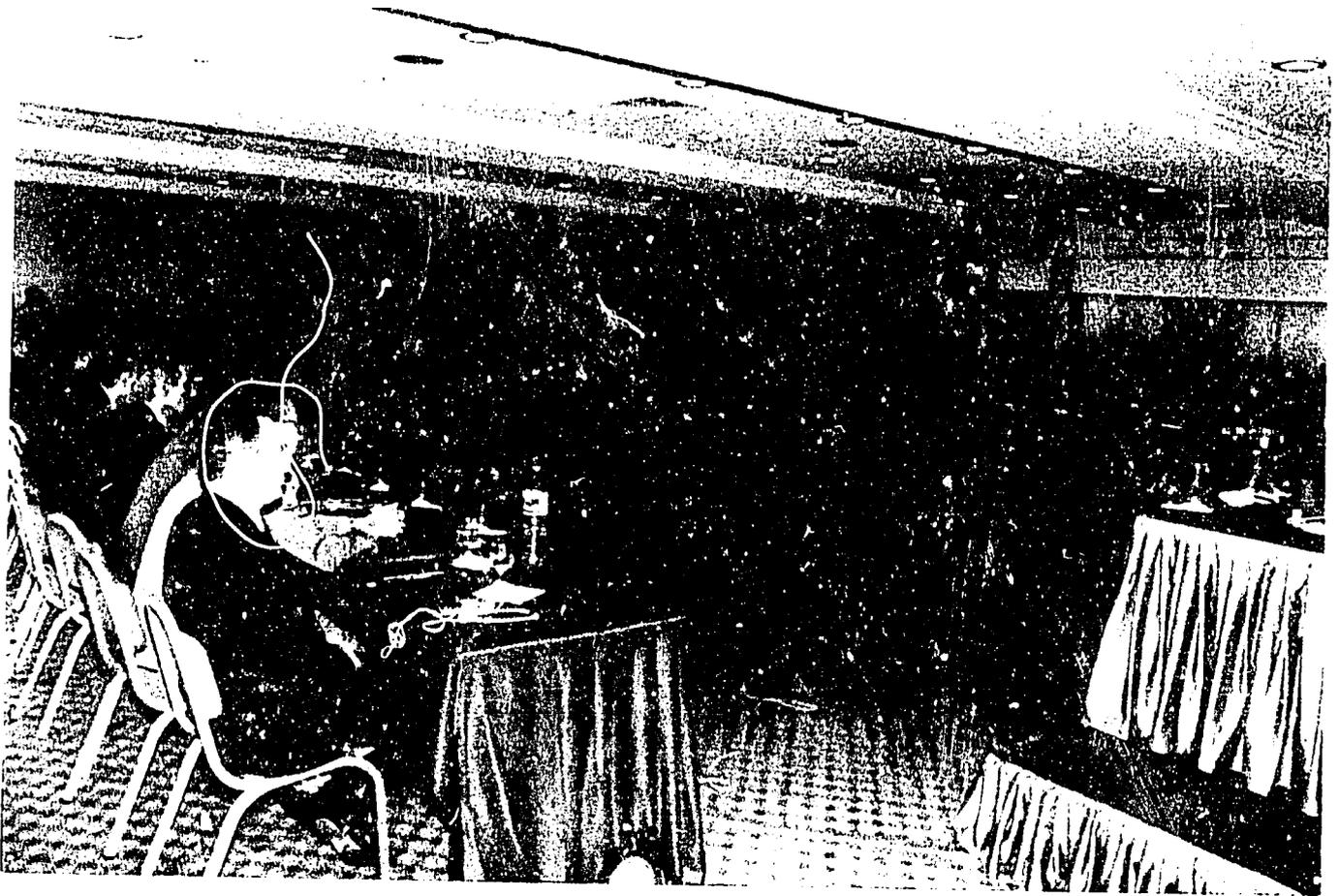
Staff must be provided to physically monitor the contractor's performance in the field and to resolve disputes between the contractor and the direct recipient of the service. These people must be intimately familiar with the contract and the public entities laws regarding the contracted function's. They should be skilled at negotiations and should have a clear understanding of their role in terms of where their function starts and where it ends. Their ability to solve problems or pass them to higher management and or the legal staff will be critical to the contract monitoring's functions success in the eyes of the service recipient, the public entity and the contractor.

Some sort of financial audit staff should be available to the contract monitoring function. Should an issue arise where a contract cost adjustment is in order, a competent financial staff should be available to determine whether the cost adjustment is fair to the contractor and the public entity. Clearly it is better if this staff were contracted, on an on-call basis, from a firm which is neutral to both parties.

Finally a certain amount of clerical staff will be required. This staff's size will be dictated by contract requirements regarding reporting functions an management and field staff's needs.

I hope that I have provided a useful insight into the contract monitoring function. Let me summarize by reminding the reader of some key points:

- a.) Effective contract monitoring begins with a good contract which clearly defines the required service level.
- b.) Legal review of the contract and the penalty/default criteria are critical.
- c.) Contract monitoring functions can be carried out in a number of ways and decisions based on the type of contract, the size of the contract and legal considerations will govern your function's structure.
- d) Some arbitration mechanism is critical to the success of the contract and to ensure flexibility in mutually beneficial contract changes.



# **STUDY OF THE PRIVATIZATION OF DOMESTIC SOLID WASTE SERVICES: MUNICIPALITY OF EL JADIDA**

presented by

**Mr. Rachid Amani, Chief Engineer of El Jadida,  
representing Mr. Tahar Masmoudi, Mayor of El Jadida**

## **I - INTRODUCTION**

Located on the coastline and in the midst of lush farm land, El Jadida enjoys a site well suited to tourism and fishing and it helps to promote the city as a major urban center in Morocco.

Furthermore, with the current regionalization and deconcentration process, the city is bound to become an industrial and transportation hub as the first decentralization phase away from Casablanca central influence begins.

Over the past few years, the Jorf Lasfar industrial complex has supplemented the traditional regional economy, giving it a boost and providing the best opportunities for future development in Greater El Jadida.

Consequently, as part of national mining and regional development policies, Jorf Lasfar will host large chemical, petrochemical, industrial and harbor facilities. Therefore, the city is making significant efforts to:

- Collect garbage collection and control illegal dumping in order to curtail contamination of urban areas.
- Develop an effective environmental policy.
- Develop efficient waste collection and disposal systems.

## **II - BACKGROUND**

The city of El Jadida (population estimates for 1991: 144,000) spreads over 6,175 acres of which two thirds are urbanized.

In 1991, it was estimated that 121 tons of garbage were generated per day (103 tons were collected daily).

### III - EQUIPMENT, INFRASTRUCTURE AND ORGANIZATION FOR GARBAGE COLLECTION:

#### 1 - COLLECTION EQUIPMENT:

The Municipality operates the following collection equipment:

Designation	Quantity	Capacity (in m <sup>3</sup> )
Pick-up trucks	7	4
Compactor trucks	2	8
Vans	5	2
Dumpers	8	1
Carts	2	2

This collection fleet is made up of vehicles with a lifetime over 10 years (3 pick-up trucks, 1 compactor trucks, 8 dumpers, 2 carts are to be retired but the remaining equipment dates back to 1986.)

#### 2 - COMPUTING COLLECTED TONNAGE:

When all vehicles assigned to garbage collection are operational, collected tonnage is as follows:

Vehicles	Quantity	Capacity of trips	Number	Total Capacity
Pick-up trucks	7	2	3	42
Compactor trucks	2	4	2	16
Vans	5	1	5	25
Dumpers	8	0,5	4	16
Carts	2	1	2	4
			TOTAL	103 t/day

Actual collected tonnage is significantly lower than above data due to several vehicle failures as well as manpower shortages.

#### 3 - COMPUTING TONNAGE OF GENERATED GARBAGE

##### 3-1- DETERMINING AVERAGE GARBAGE PRODUCTION:

From studies carried out in a city similar to El Jadida in May 1988, it would appear that garbage production amounts to about 1.40 pounds/day/person due to:

-better standards of living;

-building of industrial facilities.

Average garbage production is likely to increase as follows:

Year	1988	1989	1990	1991	1992	1993	1994
Average production	0,64	0,65	0,70	0,71	0,72	0,74	0,75

### 3-2- PROJECTED TONNAGE OF GENERATED GARBAGE:

Year	1990	1991	1992	1993	1994	1995
Population	135 000	144 000	153 000	160 000	167 000	174 000
Annual tonnage	34 500	37 300	40 200	42 600	45 100	47 600
Daily tonnage	112	121	131	139	147	155

### 4 - STAFF

\* In each truck, there is one driver and 3 crew members; with 9 trucks, we have a total of 9 drivers and 27 crew members.

\* In each van, there is one driver and 3 crew members; with 5 vans, we have a total of 5 drivers and 15 crew members.

\* In each dumper, there is one driver and 2 crew members; with 8 dumpers, we have a total of 8 drivers and 16 crew members.

\* In each bus, there is one sweeper; with 50 buses, we have a total of 50 sweepers.

\* Landfill guard

- Total staff:

- 4 team leaders

- 22 drivers

- 59 crew members

- 50 sweepers

i.e. 135 collection employees in total.

**5 - COLLECTION EQUIPMENT NEEDED:**

**a) Equipment to be retired**

Vehicles with a lifetime over 10 years must be immediately replaced in order to curb increasingly higher maintenance costs and operate this fleet under normal conditions.

Therefore, the following equipment will be retired in 1992:

- 3 pick-up trucks
- 1 compactor truck
- 8 dumpers
- 2 carts

**b) Projected needs**

Background: Main data relating to collection vehicles used by the city is summarized as follows:

Designation	Number of trips/day	Capacity per unit (tons)	Daily capacity (tons)
Pick-up trucks	3	2	6
Compactor trucks	2	4	8
Vans	5	1	1
Dumpers	4	0,5	2
Carts	1	2	2

Equipment needs may be assessed by taking into account the daily capacity of each vehicle and the difference between collected and generated garbage tonnage.

(See following table)

	1992	1993	1994	1995
Daily collected tonnage	103	133	139	147
Daily generated tonnage	131	139	147	155
Deficit (t/day)	28	6	8	8
Proposed number of vehicles to bridge gap	1 c tr 2 pick-up 2 vans	1 p-up	1 c t	1 truck. 1 van
New capacity with more coll. equip. t/d	133	139	147	158

Collection fleet and collected tonnage are projected to increase as indicated below:

	1991		1992		1993		1994		1995	
	Qty	Ton.								
Pick-up trucks	7	42	9	54	10	60	10	60	11	66
Compactor trucks	2	16	3	24	3	24	4	32	4	32
Vans	5	25	11	55	11	55	11	55	12	60
Dumpers	8	116	—	—	—	—	—	—	—	—
<b>Daily tonnage</b>		<b>103</b>		<b>133</b>		<b>139</b>		<b>147</b>		<b>158</b>

c) Replacement of vehicles to be retired (1992)

3 pick-up trucks	$300,000 \times 3 =$	900,000
1 compactor truck	$600,000 \times 1 =$	600,000
4 vans	$170,000 \times 4 =$	680,000
	=====	
Total:		2,180,000 Dh

1992 requirements to bridge the gap:

2 pick-up trucks	$300,000 \times 2 =$	600,000
1 compactor truck	$600,000 \times 1 =$	600,000
2 vans	$170,000 \times 2 =$	340,000
	=====	
Total:		1,540,000 Dh

1993 requirements to bridge the gap:

1 pick-up truck	$300,000 \times 1 =$	300,000
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1994 requirements to bridge the gap:

1 compactor truck	$600,000 \times 1 =$	600,000
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1995 requirements to bridge the gap:

1 pick-up truck	$300,000 \times 1 =$	300,000
1 van	$170,000 \times 1 =$	170,000
	=====	
Total:		470,000 Dh

## CONSOLIDATED TABLE

Year	1992	1993	1994	1995
Required invest. (Dh)	3 720 000	300 000	600 000	470 000

### 6 - COLLECTION STAFF REQUIREMENTS

#### 6-1- CURRENT SITUATION (1991)

We have:

1 technician  
 4 team leaders  
 22 drivers  
 59 crew members  
 50 sweepers

In the years to come, 3 more technicians will be hired to adequately organize and supervise collection activities. The number of sweepers evolves according to daily collected tonnage.

Consequently, staff requirements are as follows:

Year	1991	1992	1993	1994	1995
Technicians	1	4	4	4	4
Team leaders	4	4	4	4	4
Drivers	22	23	24	25	27
Crew members	59	70	73	76	82
Sweepers	50	54	58	61	64

### 7 - COMPUTING COLLECTION COSTS:

To compute collection costs, the following expenditures must be assessed:

- Yearly maintenance costs
- Amortization
- Fuel costs
- Personnel costs
- Miscellaneous costs (insurance, administrative expenditures ...)

**a) Yearly maintenance costs**

Fleet maintenance costs are expressed as a percentage of new vehicle purchasing price.

This percentage will increase as vehicles get older; percentage changes are summarized in the following table:

Year	1	2	3	4	5	6	7	8	9	10
% maintenance	4	4	5	6	7	8	9	10	11	12

After 10 years, maintenance costs are estimated to represent 15% of the vehicle purchasing price.

**b) Amortization costs:**

Amortization annuity is computed as follows:

$$A = I \frac{i}{1 - (1 + i)^{-n}}$$

where:

- I: Initial investment
- i: Actualization rate
- N: Amortization period

and

- i = 0,08 (8%)
- N = 10 years (vehicle lifetime)

Consequently, yearly annuities may be computed to amortize vehicle purchases over 10 years.

**c) Fuel costs**

Yearly fuel use and mileage are estimated as follows:

	Fuel use	Km/day	Km/year
Truck	18	40	12 280
Compactor truck	20	30	9 210
Van	12	60	18 420
Dumper	8	2	6 140

Diesel prices are also estimated to increase as follows:

Year	1991	1992	1993	1994	1995
Cost in Dh	3,93	4	4,10	4,15	4,20

#### d) Personnel costs

These expenditures are computed on the basis of gross monthly salaries for collection staff, i.e.:

-	Technician	2,500.00
-	Team leader	1,640.00
-	Driver	1,300.00
-	Crew member	1,300.00
-	Sweeper	1,300.00

#### e) Miscellaneous costs:

These expenditures include:

- \* Salaries for office personnel and managers estimated at 8,500.00 dhs/month.
- \* Administrative costs and contributions to charities estimated at 8,000.000 dhs/year.
- \* Insurance costs broken down as follows:

2,500 / year : per van

3,500 / year: per truck

1,000 / year: per dumper

On the basis of this data, a table can be developed showing all expenditures and collection costs for one ton of garbage from 1991 to 1995.

#### IV - ISSUES RELATING TO GARBAGE COLLECTION

- \*Informal or precarious inhabited areas (slums) difficult to access with collection vehicles, lacking sufficient and adequate collection equipment and necessary infrastructures.
- \*Waste needs to be sorted out in order to protect environment (industrial waste containing hazardous materials, leaching...)
- \*Preventative maintenance for deficient equipment.
- \*Door-to-door waste collection means refuse is spread all over the streets.

## V - COLLECTION OPERATIONAL STRUCTURE:

### \* Municipality is divided into districts

Each district will have storage facilities for various types of collection equipment and miscellaneous tools. This municipal division must promote efficiency and minimize costs.

### \* Special sanitation operations

Besides daily routine waste collection and cleaning activities, the waste management department will have to organize special sanitation operations to clean up illegal dumping sites (recurrent troublesome issue) which spring up wherever the residents need to dispose of their garbage.

However, these cleaning operations must be organized according to a specific program to avoid operating on an ad hoc basis only.

### \* Implementation of various awareness programs:

- For residents.
- For staff.
- To share experiences with other municipalities.

## VI - TRANSPORTING GARBAGE TO LANDFILL

Once collected, garbage is transported to the municipal landfill.

This site is very close to the city and it becomes clear that El Jadida's fast rate of growth will prompt its relocation as it is now becoming part of urban areas.

Generally speaking, this landfill does not operate properly due to a lack of technical and financial means as well as adequate management techniques.

## VII - PRIVATIZING WASTE MANAGEMENT SERVICES

The Municipality has taken the initiative to undertake a study with the DELTRI Group on the possible privatization of waste management services, including waste pre-collection, collection, transportation to landfill, recycling, increasing waste value

and promotional campaigns to market finished products based on recycled materials.

The private company in charge will use revenues from increasing waste value to reduce collection costs or to improve quality of service.

# MOROCCAN MUNICIPALITIES: SOLID WASTE PRIVATIZATION

presented by

**Mr. René De LaRue, Chief Engineer and General Manager,  
Groupe Deltri Ltée, Canada**

## 1 INTRODUCTION

### 1.1 FOREWORD

#### **Waste: A social, economic and political issue**

Most large and small cities or municipalities are faced with increasingly severe problems in urban waste management. Yet, solid waste removal and disposal, along with street maintenance, have long been viewed as a low-level priority in urban sanitation as well as in public health. Still, these past few years waste collection and processing methods have greatly improved in the managerial and technical fields.

Today, Morocco is facing a critical situation as major investments in waste management are required. Adequate funding is lacking in the country. Therefore, a global solution must be found and it will require changes in people's lives, alternative disposal techniques and new regulatory decisions.

Against this background, it would seem that the problem of urban waste disposal is dual in nature: it is both a technical and social issue.

However, experts favor conflicting approaches and, more specifically, two basic strategies have emerged:

- a) The first (conventional) approach calls for a fee structure under which high income groups pay to support lower-income groups.
- b) The second strategy called "politico-social economics" considers waste as a new means of production, thereby changing a "production-consumption" cycle into a "production-consumption-production" cycle.
- c) The purpose of this paper is to outline the waste collection and disposal program in El Jadida.

## **1.2 MAJOR ISSUES**

For several years now, communities have launched major efforts in the area of waste collection, management and disposal. Success rates still vary and while most people benefit from regular waste collection services, there remains too many illegal dumping sites or badly managed areas which are an eyesore and detrimental to the environment.

However, most large and small cities or municipalities are faced with increasingly serious problems in urban waste management.

The problems are related to spiralling costs of this municipal service and, in large part, to the inconveniences created by the waste collection and disposal system. Consequently, it is critical to develop efficient systems.

Solid waste management is a problem in most countries. According to the economic, social and geographic environment of the region under study, there is a need to strike the best balance between the following considerations:

- transportation;
- investment and operation;
- acceptable levels of residual environmental hazards.

Urban waste is viewed as a waste to be disposed of at the lowest possible cost.

Disposal techniques have been developed on this premise. Yet, various new processes have recently emerged. Their purpose is to add value to waste, either by extracting various materials used to produce the discarded item (sorting out) or by turning them into high-energy content products, easy to store and use as fuel.

A new waste management system based on updated data and societal trends is now becoming necessary. This new approach calls for waste reduction, reuse, retrieval, recycling and increasing waste value.

A series of achievements in American, Canadian and European cities indicates that we are not dealing only with environmentalist concerns but indeed with major changes impacting on society's day-to-day behavioral patterns and technological choices.

## **2 MOROCCAN MUNICIPALITIES**

### **2.1 STATUS OVERVIEW**

Solid waste collection and disposal activities seem to put Moroccan municipalities in a dire predicament.

Adequate funding could substantially increase human and technical resources in order to provide satisfactory services if municipalities are to continue to carry out these tasks.

This situation is a hardship in day-to-day activities:

- waste can not frequently be collected in its entirety;
- consequently, unhealthy dumping sites may be established in the middle of the city;
- frequent truck break-downs disrupt collection activities.

Barring increased funding for municipal waste management, other avenues must be explored, i.e. total or partial privatization of this service.

An integrated approach to municipal waste management requires active involvement of residents and industries and, generally, its purposes are as follows:

- To reduce, recover and recycle waste and to increase its value;
- To choose optimal and selective collection methods;
- To give priority to solutions with minimal impact on the environment;
- To inform populations and to increase their awareness;
- To adopt reasonable solutions in line with short-term municipal needs;
- To choose long-term solutions.

## 2.2 COLLECTION ACTIVITIES

At the heart of the various financial constraints of municipalities, is the need to streamline services and the structure of the organization. There exists a substantial opportunity to improve the efficiency of collection services. Streamlining also calls for implementing management and follow-up criteria.

Scales are required at waste disposal, processing and transfer sites in order to compute waste collected per truck from each neighborhood and from the municipality as a whole on a daily basis.

For example, from a more technical standpoint and for global collection planning activities, it would be appropriate to set up transfer sites since some neighborhoods are quite distant from landfill areas.

The basic advantage of transfer sites is undeniably lower transportation costs, but more important is the resulting decrease in wear and tear on the municipal vehicle fleet.

In the final analysis, cities may choose between two solid waste management policies: (partial or complete) privatization or efficient management of this service by the municipality itself.

In case a city plans to continue providing these services, it should then implement a set of policies according to two basic objectives:

- To provide optimal conditions for equipment use by way of operational maintenance guidelines, to establish transfer sites and to define appropriate investments to be made.
- To use equipment according to optimized management criteria, i.e. follow-up activities, personnel training, control and securing of adequate financial resources.

### **2.3 PRICING POLICY**

Solid waste collection fees are relatively low. While all other municipal services need to be financed, it is critical that the citizenry become accustomed to paying for the various services they come to expect from public agencies.

These sanitation fees should be adequate to finance solid waste services and ensure collection and disposal in satisfactory conditions.

While it is difficult to charge an adequate fee for waste collection and disposal in view of other constraints, this must become one of the city's priorities.

### **2.4 COLLECTION SCHEDULE**

Large Moroccan cities have tended to rely on the local population to meet daily collection services. A special effort must be made to organize instead two to three collections per week. Costs would then be substantially reduced.

Intermittent collection services have become quite common in Europe and in North America where most large cities provide bi-weekly service.

### **2.5 LANDFILLS**

For the most part, collected waste is shipped to public landfills.

It must be noted that most cities do not adequately cover up their waste, a practice which is conducive to the spreading of disease organisms.

Generally speaking, landfills are plagued with insufficient technical and financial means and inadequate management policies.

### **2.6 PERSONNEL TRAINING**

Generally speaking, there is a need to set up training programs for solid waste collection personnel, i.e.:

- crew members
- team leaders
- managers and municipal directors.

### **2.7 PREVENTATIVE MAINTENANCE**

In order to amortize current and future investments, it is necessary to implement a computer-aided preventative maintenance program for all stationary and mobile equipment and to follow-up operational records.

Very few municipalities operate according to this system which is simple to operate, cheap to implement and extremely cost-efficient.

## 2.8 BEACH CLEANING

When a city is fortunate enough to be graced with beaches, these areas must not become soiled; therefore, an emergency system must be set up so that when waste pollution is detected, a team can immediately intervene to clean up the beach.

This goes beyond mere environmental protection. Tourists must never see waste floating in the sea or marring beaches. From this standpoint, the waste issue is very costly in terms of lost revenues, for unclean beaches deter tourism and therefore cost money to the community. Generally speaking, while significant efforts have been made to keep beaches clean, there is a need to add strict enforcement policies.

## 2.9 SELECTIVE COLLECTION ACTIVITIES

In contrast to other methods, selective collection calls for picking up various sets of retrievable waste, i.e.:

- paper and cardboard;
- glass containers in order to recycle broken glass or reuse bottles;
- some types of plastics;
- textiles.

These products may be reused as raw materials by various industries provided some conditions are met.

The main benefits of this policy are as follows:

- lower processing costs as waste volume to be disposed of is decreased;
- lower raw materials costs for the country.

Successful selective collection practices hinge upon:

- stable and lasting marketing opportunities for recovered materials;
- careful development of an operational plan. More specifically, the current collection and processing system should be taken into account;
- adequate volume and value levels of recovered materials to ensure positive cash-flow;
- recovered materials must effectively be usable by industry: indeed, recovered waste volume must be constant (i.e., hollow glass must be devoid of window glass pieces); processing must be adequate (i.e. papers and cardboards must be delivered in bales.)

This approach requires extensive collaboration among users.

Most Moroccan decision-makers we met said at first: "Our population is not ready for this type of collection." Following these discussions, it would still appear very promising to start a ten-year awareness and selective collection program even if, for the first two years, only 10 per cent of the residents would be reached.

## 2.10 AWARENESS PROGRAM

Generally speaking, to start an efficient solid waste disposal program, it is imperative to include an awareness program involving various private, semi-private and public institutions as well as the media. The participation of grass-roots organizations and social clubs must also be considered.

The purpose of this program is to increase urban residents' awareness, to give them guidance and promote their active involvement in a process which is more and more pressing every day: improving the quality of the environment.

The process of change in lifestyle patterns hinges upon improved economic conditions and vice versa.

An awareness program must have specific objectives, i.e.:

- to create awareness
- to motivate
- to provide guidance.

Program elements must be adjusted on the basis of its achievements.

### 2.10.1 OUTREACH-AWARENESS-HEALTH EDUCATION PROGRAM

#### a) Goals

- i) To improve urban residents health ;
- ii) To update and set up necessary structures for facilities management and maintenance.
- iii) To implement an awareness program simultaneously with a waste collection program which will also include used and rain water.

#### b) Objective

An awareness program must include the various following elements:

- i) To prepare and to encourage local residents to participate in the program, choose dumpster location, collection routes, etc.
- ii) To set up collection site, water management and neighborhood sanitation committees in consultation with traditional leaders and public officials in each relevant neighborhood;
- iii) To locate and/or develop educational materials to increase population awareness;
- iv) To develop and implement training-awareness programs targeting each of the following groups in each neighborhood:
  - collection committees;
  - water and waste management committees in each neighborhood;
  - .high-school students and teachers;

- parents associations;
- women's groups;
- religious organizations;
- traditional leaders;
- all residents in each neighborhood.

#### 2.10.2 METHODOLOGY

##### a) Connecting with existing regulatory structures

It would seem important to connect and to put the whole program, including its awareness and sanitation components, in agreement with current and local regulatory structures to maximize collaboration but also to allow them to take on follow-up activities.

By contrast, outreach, awareness and training programs call for changes in behavior and attitudes and this is often met with reluctance. For example, female involvement in management roles is not necessarily taken for granted.

Without being too pushy, outreach agents will have to emphasize the importance of such issues. The same goes for fee (tax) collection; our experience indicating that good will within agencies is not enough to achieve results.

##### b) Connecting with traditional structures

It seems obvious to us that the task to increase awareness and educate residents will not only involve public officials but above all traditional structures.

For the most part, resident awareness activities will be carried out under the leadership of elected representatives in each neighborhood, in order to:

- Select dumpsters location;
- Encourage residents to participate;
- Set up collection and management committees in each neighborhood, etc...

##### c) Female participation

While identifying waste collection points, outreach agents will have an opportunity to make people aware that garbage is everyone's business.

The purpose is not to change cultural patterns defining who is in charge of water supply or waste disposal but rather to stress the point that since women take on so many responsibilities in this area, then they can and must be involved in management, at all levels.

Consequently, it will be stressed that women must be included in waste collection points and management committees in neighborhoods, districts and municipalities. Women groups may prove to be good partners for the outreach team in meeting these objectives.

##### d) Neighborhood and district management committees

Since several dumpsters will be set up in each neighborhood, a management committee must be established in each city area. In this manner, we are more in agreement with the existing traditional structure.

e) Municipal committee

The municipal committee will be responsible for the proper operation of all facilities city-wide and it will supervise technical tasks as well as global maintenance monitoring in each neighborhood.

This committee should develop general policy guidelines and set up management criteria to operate the system.

f) Training program development and implementation

The major challenge for the team in charge of awareness and sanitation activities will be to develop and implement adequate training programs targeting each of the following groups:

- dumpster committees;
- neighborhood and municipal committees;
- teachers and students;
- sanitation committees in each neighborhood;
- the population at large.

The main purpose of these training seminars will be to inform all resident groups about health and sanitation guidelines in a clearly understandable way.

Another assignment for the outreach team will be to identify or develop training materials for the various seminars. These materials must be tailored to cultural patterns and local needs.

g) Instructors continued training

Once each of the above named groups have undergone training, the outreach team will poll again the residents

to verify knowledge retention, assess program efficiency and develop a second round of training sessions for each of the groups.

At this time, instructors will sharpen their outreach skills and define various areas to focus on during this second series of seminars.

## 2.11 INCREASING WASTE VALUE AND RECYCLING

Increasing solid waste value and recycling would undeniably be a competitive advantage for Morocco since in reusing residential waste, the country would cut on imports (i.e. raw resin). Local companies would also benefit from recycled waste as it would become

quality raw materials available at a much lower cost. Furthermore, a direct benefit would be to increase local manufacturers' exporting capacity.

Thus, several countries have implemented recycling programs in various economic sectors. Some have specialized in pulp and paper, others in metals or in various plastics available in local markets.

#### 2.11.1 MANPOWER CHARACTERISTICS RELATING TO COLLECTION, REPAIR AND RECYCLING ACTIVITIES

For residential waste recycling, there are various alternatives which will determine sorting activities and the equipment to be used. One major consideration is that, whatever the choice, manpower requirements will be significant since several tasks will be handled manually.

Given these combined characteristics, sorting out will be inadequate if recycled raw materials are not compatible with each other. In countries with low-cost manpower, recycling companies have a definite advantage, such is the case in Morocco.

#### 2.11.2 PLASTICS RECYCLING

For the company to be, this venture would be advantageous in the short and in the long run as the demand for such a product is growing. Recycling would also ease space and pollution problems in cities.

Depletion of natural resources, namely finite resources, has given rise to a whole new series of recycling activities. The number of ventures is rapidly expanding in textiles, metals and more recently plastics production.

This trend is reinforced by a rapidly increasing use of plastics in lieu of glass in food processing, for example, or steel in the car industry.

Higher raw materials costs and new technologies make recycling an attractive alternative. Landfills are littered with plastics but recycling provides new raw materials at about 60% of the price of raw resins.

Plastics use grows at about 15-20% per year versus 3% for steel and 5-10% for aluminum products. Consequently, there will be an increasing volume of plastics to recycle (polypropylene and polyethylene plastics alike).

##### a) Goals

The goals of this program are as follows:

- To operationalize decontamination and recycling technology for plastics, residential and industrial waste.
- To recover and recycle plastic waste; a definite advantage for the country as space taken up by waste in landfills and costs of these sites would be lower.
- To diversify markets and plastics suppliers.

#### b) Plastics processing

Currently, the plastics industry is growing faster than any other economic sector in the world. This growth is due to lower costs when compared to competitive products and to the specific physical and chemical properties and characteristics associated with plastics: low weight, clean product.

This situation is not likely to change given the number of industrial applications for plastics; as an example, in the car industry, the rate of plastics substitution for some components (fenders, dash-board, steering wheel, etc...) ranges between 20 to 25%.

#### c) Realistic volumes of retrievable plastics

Experience with selective collection of plastics has been most successful in Germany. Eight pounds of rigid plastics and 6 pounds of flexible plastics are recovered per person per year.

However, the share of plastics actually recovered by way of selective collection is only 25 to 30% of the potential available plastics stream in residential garbage. Recovered quantities depend on how many residents get involved.

Furthermore, packing materials are better suited for selective collection than plastics used in the manufacturing of household and kitchen appliances, toys, etc.. This latter group includes not only plastics but also metal pieces and is therefore a less valuable "source" than packing materials.

When systematic selective collection is not feasible, sorting materials by hand in landfills is a way to boost plant efficiency.

#### d) Future prospects

If plastics-based items and components are available today on the market, it is mainly due to recycling companies which are attracted by lower production costs associated with the use of recycled resins.

Moreover, various wood types and metals can be replaced with plastics and this contributes to lower production costs.

Environmental problems due to plastics waste are also greatly reduced.

Multinational plastics manufacturers only get involved in recycling plastics-based consumer goods when restrictive legislation is likely to jeopardize their markets.

It would not be realistic to expect the plastics industry to promote recycling activities that would compete with its baseline products.

#### e) Recycled products

The company will mainly recycle low and high density propylene and polyethylene products and other plastics-based items.

Typical recyclable products:

- Discarded drainage pipes
- Plastic vials for pharmaceuticals
- Chlorox plastic bottles
- Shampoo plastic bottles
- Plastic bags
- Plastic sheets (from greenhouses)
- Any other type of plastics

(No polyester-based product, coca-cola bottles...)

f) Impact of plastics recycling on the market

Growth prospects for a small business recycling residential or industrial plastic waste are most promising due to new emerging market opportunities on society as a whole.

There is a need to limit plastic waste accumulation in landfills, dumping sites, streets, markets, beaches and so on.

Various alternatives are thus feasible to solve other issues and manufacture products at reasonable prices, such as:

- tubing and pipes
- containers
- waste water drainage pipes
- toys for children
- chairs, tables, garden furniture
- road signs

Mass production of garbage bags and garbage cans may also be feasible on industrial activities

Recycling can have a major impact in cities with or without plastics manufacturers.

Manufacturing goods at much lower costs with raw materials originating from recycling could also promote other plastics-related economic activities.

Furthermore, in combining recycled plastics (35%) to raw plastics, the cost of traditional manufacturing would be decreased and total production given a boost.

### 2.11.3 BRASS RECYCLING

a) Program identification

The purpose of this brass recovery and recycling program is:

- to operationalize the decontamination and recycling technology for recovered industrial and residential brass materials and items;
- to recover and recycle a type of raw materials indefinitely recyclable at a cost significantly lower than the raw product price;
- to market some of the recycled products;
- to turn some of the products into ingots of various alloys and various metal contents:
  - brass-bronze alloy
  - brass-copper alloy
  - brass-aluminum alloy
  - brass-lead alloy;
- to promote diversification of markets and brass suppliers;
- to transfer technology and know-how in this targeted economic activity.

b) Targeted markets

Industry and cottage industry are the two targeted markets. There will be local, regional and possibly national marketing opportunities for ingots of various metal contents and types.

There will be national and international bidding for contracting work as well as know-how and technology transfer in the various areas where skills are required.

c) Market study

- Product definition

Products to be manufactured will vary according to recovered metal types and contents and to customer-defined specifications.

However, in the short term the following product baseline will be offered:

- |                         |                    |
|-------------------------|--------------------|
| - brass ingots          | 100% brass content |
| - brass-lead ingots     | (50%-50%)          |
| - brass-lead ingots     | (75%-25%)          |
| - brass-aluminum ingots | (50%-50%)          |
| - brass-aluminum ingots | (75%-25%)          |
| - brass-bronze ingots   | (50%-50%)          |

- brass-bronze ingots (75%-25%)

- Product demand

It is likely that users of original or raw brass will want specific applications for recycled brass. However, as costs to produce brass get higher and higher, the quality/price ratio should promote recycled brass use.

- Product supply

Currently, recycled brass supply is almost nil except for industrial waste which is directly put back into kilns and molded in brass transformers.

#### 2.11.4 GLASS RECYCLING

a) Product definition

Glass is an indefinitely recyclable material and therefore a most valuable product to recover.

Glass items are gathered from collection, sorting out centers and/or landfills, then they are crushed, decontaminated and shipped to processing companies.

Consequently, two major tasks would be undertaken:

- to decontaminate and crush glass items to be recycled
- to recover and decontaminate beverages in violation with standards (seized liquor or alcohol of dubious quality, beer sold after expiration date and destruction of unlawful beverages)

b) Targeted markets

The targeted markets will be:

- local for glass recovery and crushing;
- local and regional for the sale of crushed glass;
- national and international for contracting work as well as know-how and technology transfer in the various areas where skills are required.

#### 2.11.5 ALUMINUM RECYCLING

a) Introduction

Each year, aluminum manufacturers discard thousands of tons of waste. Waste storing, recycling and processing is an economic and environmental issue of major proportions for the aluminum processing industry.

The bulk of non-ferrous metals is made of linings from used vats, cans, carpentry refuse and linings from electrolyte baths. Magnesium and nickel make up the remainder of metal

waste. Recycling these metals may save from 75 to 97% of used energy. Furthermore, aluminum recycling would reduce metal solid waste accumulation by 98%, energy use by 96%, water and air pollution by 78% and 95% respectively.

b) Use of metal waste

The extent of metal waste use in new metal manufacturing varies from one metal to the other. Metal waste is sorted out, decontaminated and then melted into ingots. These ingots are to be sent to smelting-houses for manufacturing of moulded items.

c) Metal waste recycling limitations

The main problem recycling companies face on a daily basis is metal waste contamination.

Developing adequate equipment to identify metals and improve sorting out, cleaning and processing techniques would undoubtedly improve this situation.

Recovery and recycling rates for aluminum would also be increased.

d) Metal waste supply sources

There are four main metal waste supply sources:

- in-house manufacturing waste
- industrial waste resulting from metal processing
- discarded items, no longer useful
- cans and residential waste.

#### 2.11.6 WASTE PAPER RECYCLING

a) Introduction

Paper and paper products account for more than one third of municipal waste. It is now recognized that waste paper volume must be significantly reduced, without delay. Many cities are not only short of landfill sites, but the viability of forest resources is also at stake.

One obvious method to decrease waste paper volumes and preserve forest resources is to recycle used paper.

Out of the six million tons of paper and cardboard used annually in Canada, it is estimated that less than 25 per cent is recycled. This data is very hard to assess in developing countries and it would seem that paper recycling is significantly lower.

Obviously not all papers can be recycled: about 20% can not be reused for various reasons. In some cases, paper is burnt or it is permanently kept (books, roofing materials, etc...) in other cases, it is so contaminated than it can not be recycled.

However, for the most part, millions of tons of paper products entering the waste stream each year can be recycled.

b) Recovering "consumer" waste

For years, paper manufacturers have recycled used paper from production activities (waste from mills), processing and printing.

Today, the real challenge is to recover and recycle consumer waste, i.e. paper products which have been used and discarded by consumers and companies. There is more and more emphasis on recycling throughout the world as waste disposal costs are increasing.

c) Industry

During the past few years, consumer concerns for the environment have prompted the paper industry to market recycled paper-based products. This is a major and unprecedented change.

For several years, manufacturers of fine grade papers have been using up to 20% of recycled and inkless pulp in order to cut costs. This is the maximum amount that could be used while providing customers with a satisfactory product.

d) Consumers in the 1980s

However, during the past decade, a drastic change started to occur in the world: consumers began to request more recycled paper pulp, with little concern for the appearance of the final product.

Therefore, more and more recycled paper products are now on the market, from letterhead to printing paper, paper towels and tissues. These products bear the label: recycled, unbleached paper.

Various printed materials (circulars, catalogues, magazines, etc.) bear the indication "recyclable" or "printed with natural ink". Some oil companies even issue rebate coupons mentioning "recyclable paper".

#### 2.11.7 COMPOST FOR FARMING

a) Compost use worldwide

For several years, public officials have been concerned with promoting composting for farm use as a way to dispose of residential waste.

Unfortunately, current composting facilities in Morocco (and in many other countries) are not efficient. There is a need to review technological issues in detail and to decide whether or not privatization could bring a significant improvement.

Furthermore, in this approach, it is critical to involve agricultural colleges and more importantly farm cooperatives (potential buyers).

### 2.11.8 CONCLUSIONS

On the basis of research findings, we may conclude that residential waste recycling is cost-effective provided the two following prerequisites are met:

- a) The collection and sorting system must operate adequately.
- b) Markets for products manufactured with recycled materials must be studied and clearly defined.

In general terms, as could be expected, manufacturing of finished products (i.e. tubing) with recycled materials is very profitable.

## 3 BACKGROUND INFORMATION ON THE CITY OF EL JADIDA

### 3.1 PRIVATIZING WASTE MANAGEMENT SERVICES

Today, waste collection services provided by private companies meet with consumer satisfaction in various cities around the world.

Such an alternative is currently being reviewed in El Jadida. Indeed, the city is considering whether or not it would be appropriate to allow a private organization to handle municipal waste management. This company would be a subsidiary of Société Mixte and would provide a complete range of waste management services.

Two methods are being reviewed to promote cost-effectiveness:

- to use revenues derived from increasing waste value;
- to implement technologies most conducive to cut waste collection costs and improve service quality.

It is absolutely necessary to set up a program for the sanitation of all city neighborhoods, including those which have neither drainage facilities nor collection services at the present time.

The organizational chart included in the appendix describes a holding company that could be entirely or partially private.

The service contract should extend over the long term (at least 10 years) so that the private company can make investments and amortize its venture.

Furthermore, a network of companies will have to be set up to increase waste value by way of recycling and to manufacture finished products with recycled materials as raw materials.

### 3.2 TECHNOLOGY TRANSFER

This transfer will involve proven technologies which are mastered by the various holding companies providing solid waste collection and disposal services as well as corporate management methods and approaches responsible for our Group's long-standing success.

The holding company we are planning to create within the El Jadida, Société Mixte, will be responsible for integrated management of municipal solid waste services. Furthermore, it will control marketing opportunities to further its growth and increase its profitability.

To ensure long-term project viability, an organizational structure must be established so that managers can acquire all necessary operational skills for self-sufficiency, particularly after the possible departure of our Canadian partner.

To this end, it is necessary to implement a technology transfer adapted to program specifics.

Our Canadian partners are planning to recruit 5% of the staff at the most from overseas. Indeed, for this type of project, there is no better personnel than a Moroccan team.

A complete technology transfer program does not only include passing on new technology, it must also provide a staff training component to the new techniques.

In this manner, the various Moroccan associates involved will not only benefit from a new technology but, later on, they will be able to operate without being entirely dependent on the Canadian holding company to ensure proper routine operations of the newly founded company.

To promote self-sufficiency, the training program must involve all corporate divisions. These courses will have to address not only technical but also administrative issues.

To promote efficient learning in the new concepts which must be acquired, Moroccan managers will undergo training in Canada.

This training will give them an opportunity to observe in detail the new technologies they will be using and to acquire first-hand experience.

Therefore, the purpose of our technology transfer program is to give Moroccan entrepreneurs and managers enough experience to run their company on their own.

### **3.3 BENEFITS AND IMPACT ON THE ENVIRONMENT**

From two standpoints, environment and regional economic development, our program offers unique characteristics. Indeed, it will not only promote social and economic development in the El Jadida area, but obviously also better the environment.

With home-based technologies, it is possible at low cost to manufacture containers and dumpsters of all sizes to transport dry and semi-dry solid waste.

Some containers may also be adequate to transport hazardous liquid substances originating from industrial waste. Odor and leakage problems during transport and temporary storage have been reviewed and solved.

Instead of building permanent facilities on the least inappropriate sites as is often the case, the city of El Jadida can be given the flexibility to concentrate its best strategic locations

with one or several transfer sites in order to solve very localized storage and transfer problems in some urban or peripheral areas of the city.

Moreover, increasing waste value by way of plastics recycling, for example, not only decreases the volume of waste to be buried but also promotes regional social and economic development.

One priority for the holding company to be set up in El Jadida will be to become an efficient instrument for environmental protection. Major emphasis must be given to approaches which will have minimal negative repercussions on the environment and the best possible impact on the population and on the regional economy.

In promoting implementation of this project, the city of El Jadida has found a way to solve issues of great concern to municipal officials, i.e.:

- to optimize waste collection routes
- to use a flexible approach in setting up transfer sites in appropriate locations
- to improve container manufacturing standards (more water-proof, appealing and easy to handle)
- to markedly improve the quality of environment
- to promote profitable economic activities in providing services viewed as municipal expenditures (a necessary "evil")
- to recycle organic materials

As El Jadida starts to upgrade its waste collection system, the city is embarking upon an irreversible process leading to integrated management of municipal solid waste.

Indeed, in the next program phase, El Jadida will have every opportunity to recover and recycle plastics, glass, metals and paper products as a selective collection system will have been set up and actively supported by city residents.

To optimize collection services management makes economic sense and significantly decreases costs; it also diminishes negative social and environmental impacts usually associated with solid waste collection and disposal.

We shall help public officials to prepare and set up an awareness program for waste recovery and recycling. This project will be tied to promoting better personal and general health.

The tables that follow on the subsequent pages highlight the significant volumes of major inorganic wastes which will be generated in El Jadida from 1990 to year 2000 and in 2015.

#### 4 MAJOR FINDINGS

A joint Canadian-Moroccan venture in El Jadida will create several new positions.

According to our plan, staff requirements will be as follows: 25% technicians, 75% crew members.

Morocco is endowed with adequate qualified manpower resources. Consequently, several technical positions will be created with this project which will help to curb unemployment in the country. Moreover, our training program will contribute to increasing the number of technical staff in Morocco.

Non-technical personnel could be comprised of men and women in equal numbers (some tasks, i.e. sorting out by hand, do not require physical strength), thus promoting female integration into the work-force. Handicapped staff could also be hired.

Waste management is everyone's responsibility: we all have a critical role to play to encourage recycling and waste reduction in general. With a change in patterns and attitudes, at home and at work, residents are in a position to significantly reduce the volume of waste generated.

Recycling residential waste is a way to alleviate space scarcity (it will tend to decrease the volume of waste to be buried thereby limiting landfill surface area and/or increasing its operational lifetime) and pollution problems caused by agricultural and residential plastic waste in municipalities.

Consequently, environmental and health conditions will be improved for the benefit of city residents and surrounding municipalities. Our project will benefit the environment and health conditions in areas where children play and that should curb the incidence of childhood diseases. More family members will be able to contribute to common income.

In conjunction with local officials, it is important to implement an awareness program highlighting the significance of popular participation to a sound waste management program. This initiative will promote health within poor families. This is the first step for implementing a selective waste collection system in the long run.

Setting up the Société Mixte d'El Jadida and its subsidiary for residential waste integrated management is in agreement with Moroccan economic development goals.

More specifically, this program will help to:

- curb currency expenditures
- create value-added for Moroccan products
- promote job creation
- improve technical skills in the country.
- foster competition between various companies operating in this field
- decrease disposal costs for municipal waste
- promote better sanitation in landfills where waste accumulates without being exposed to biodegradation

- increase residents' awareness to waste accumulation in the environment and consequently increase their interest in waste recovery and recycling.

Thus harmless technical processes will generate revenues for primary economic sectors, galvanize secondary economic activities and create a basic service geared toward production rather than consumption.

Obviously, this process will require initial investments which can be amortized in a few short years. Annual revenues to be generated will translate into lower reimbursement costs, a boost to diversified and better basic goods and services delivery.

Finally, in view of relatively low costs, profit and job creation potential, it is our view that this type of development constitutes a necessity for society, a sound approach for the environment and a profitable avenue for the economy.

**QUANTITY OF SOLID WASTE GENERATED**  
**by the MUNICIPALITY OF EL JADIDA**  
**in 1990**

SECTOR NUMBER	POPULATION	QUANTITY OF SOLID WASTE (in tons)							
		Total	Paper cartons	GLASS	Metal	PLASTIC	Textile	DECOMP-OSABLE MATERIAL	Other
1	5 038	1 180	224	9	24	30	35	797	62
2	5 229	1 225	233	9	25	31	37	827	64
3	10 606	2 485	472	19	30	62	75	1 678	130
4	5 372	1 259	239	9	25	31	38	850	66
5	5 805	1 360	258	10	27	34	41	918	71
6	2 700	633	120	6	13	16	19	427	33
7	3 982	933	177	7	19	23	28	630	49
8	2 392	561	106	4	11	14	17	378	29
9	11 888	2 786	529	21	56	70	84	1 880	146
9.1	26 089	6 114	1 162	46	122	153	183	4 127	321
10	19 491	4 567	868	34	91	114	137	3 083	240
11	4 029	944	179	7	19	24	28	637	50
12	21 839	5 117	972	38	102	125	154	3 454	269
65	2 477	580	110	4	12	15	17	392	30
211	8 063	1 889	359	14	38	47	57	1 275	99
<b>TOTAL</b>	<b>134 999</b>	<b>31 634</b>	<b>6 011</b>	<b>237</b>	<b>633</b>	<b>791</b>	<b>949</b>	<b>21 353</b>	<b>1 661</b>

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**QUANTITY of SOLID WASTE GENERATED**  
**by the MUNICIPALITY of EL JADIDA**  
**in 2000**

SECTOR NUMBER	POPULATION	QUANTITY OF SOLID WASTE (in tons)							
		Total	Paper cartons	Glass	Metal	Plastic	Textile	DECOMP-OSABLE MATERIAL	other
1	5 038	1 379	276	28	48	62	41	827	97
2	5 229	1 432	284	29	50	64	43	859	100
3	10 606	2 903	581	58	102	31	87	1 742	203
4	5 372	1 471	294	29	51	66	44	882	103
5	5 805	1 589	318	32	56	72	48	953	111
6	2 700	739	148	15	26	33	22	443	52
7	3 982	1 090	218	22	38	49	33	654	76
8	2 392	655	131	13	23	29	20	393	46
9	11 888	3 254	651	65	114	46	98	1 953	228
9.1	33 420	9 149	1 830	183	320	112	274	5 489	640
10	88 757	24 297	4 859	486	850	1 693	729	14 578	1 701
11	4 029	1 103	221	22	39	30	33	662	77
12	22 269	6 096	1 219	122	213	174	183	3 658	427
65	2 477	678	136	14	24	31	20	407	47
2E	9 037	2 474	495	49	87	11	74	1 484	173
<b>TOTAL</b>	<b>213 000</b>	<b>58 309</b>	<b>11 662</b>	<b>1 166</b>	<b>2 041</b>	<b>2 634</b>	<b>1 749</b>	<b>34 985</b>	<b>4 082</b>

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**QUANTITY of SOLID WASTE GENERATED**  
**by the MUNICIPALITY of EL JADIDA**  
**in 2015**

SECTOR NUMBER	POPULATION	QUANTITY of SOLID WASTE (in tons)							
		Total	Paper cartons	GLASS	Metal	Plastic	Textile	DECOM. MATERIAL	Other
1	5 038	1 839	405	64	92	120	64	919	175
2	5 229	1 909	420	67	95	124	67	954	131
3	10 606	3 871	858	135	194	252	135	1 936	368
4	5 372	1 961	438	69	98	127	69	980	186
5	5 805	2 119	466	74	106	138	74	1 059	201
6	2 700	986	217	34	49	64	34	493	94
7	3 982	1 453	323	51	73	91	51	727	138
8	2 392	873	192	31	44	57	31	437	83
9	11 888	4 339	953	152	217	282	152	2 170	412
9.1	35 920	13 111	2 881	459	656	852	459	6 555	1 246
10	110 272	40 249	8 055	409	2 012	2 616	1 409	20 125	3 824
11	4 029	1 470	321	51	74	96	51	735	140
12	22 269	8 128	1 781	284	406	528	284	4 064	772
65	2 477	904	194	32	45	50	32	452	86
2H	9 037	3 299	721	115	165	214	215	1 649	313
X1	18 408	6 719	1 471	235	336	437	235	3 359	638
X3	108 750	39 694	8 731	389	1 985	2 580	1 389	19 847	3 771
X4	15 831	5 778	127	202	289	376	202	2 829	549
<b>TOTAL</b>	<b>380 004</b>	<b>138 701</b>	<b>30 511</b>	<b>955</b>	<b>6 935</b>	<b>9 916</b>	<b>4 855</b>	<b>69 351</b>	<b>13 177</b>

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# INTERNATIONAL LANDFILL DEVELOPMENT: PRIVATE ENTERPRISE DEVELOPMENT ISSUES

presented by

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## I- INTRODUCTION

The adequacy of solid waste disposal facilities affects every country and each member of its population. The proper disposal of solid waste is important to all, in that the public health, the environment and community aesthetics are affected by the quality of solid waste management. Due to these factors, the past decade has witnessed an ever increasing emphasis on the implementation of technical advances in the design and construction of solid waste disposal facilities.

The traditional method of disposing of waste has been through landfilling. Certain experiences have made the public aware of the danger to the environment, and consequently to the populace, created by the design or construction of landfills of inadequate environmental integrity.

There have been instances where the simple dumping of refuse on open ground has caused the contamination of the drinking water supply which serves the community. There have been additional concerns with proliferation of animal infestation in sites which are inadequately managed and handled, with the consequential exposure to diseases.

Driven both by public outcry and regulatory requirements, the direction of the solid waste disposal industry has been to minimize the potential negative environmental impacts of disposal sites by enhancing the integrity of the containment systems used at such sites. This trend has caused landfill designers and developers to reassess existing technology and evaluate new materials and design methodologies in an effort to improve the performance of these facilities while maximizing disposal capacity. These efforts have resulted in dramatic improvements in the environmental integrity of facilities, with a commensurate increase in the expense of the design, construction and operation of the facilities.

Private enterprise has provided many of the solutions to public concerns through the installation of integrated solid waste management facilities, all within the context of operations on a for-profit basis. Because of the benefits of establishing modern waste disposal facilities, private enterprise has often been invited to work in partnership with governmental entities to address regional needs for waste disposal. This overview

addresses the elements that attract private enterprise to plan, design, construct and operate such facilities in the international forum.

The benefits to a community, in terms of the health of the population through the preservation of safe water supplies and isolation of disposal facilities, have become well known over the past half century. Of more recent impact, the benefits of modern, environmentally sound, solid waste disposal facilities have become obvious in the internationally competitive industrial markets. When viewed from a competitive side, those regions which effectively and efficiently handle solid waste disposal can achieve a substantial competitive edge when marketing locally manufactured products to those importing countries which mandate environmental practices consistent with the importing country's needs.

While the benefits of a sound solid waste management program may be readily apparent, there is necessarily a high cost for the technology for such a program. It is estimated that in 1970 the United States of America spent \$30 million on environmental improvement. That figure has grown to \$100 billion in 1990. In public and private forums, there have been discussions that as much as \$200 billion will be expended on environmental protection and improvement by the year 2000. The planning, the design, construction and operational expenses for a modern solid waste disposal facilities may exceed \$10 million.

A community developing a solid waste management program must balance the program's cost with the cost of the community's other social and public needs -- public libraries, schools, sewer and water service, street and highway maintenance and construction, police and fire protection. Where a community chooses to spend tax dollars or other revenue dollars usually depends on where the community is willing to cut back financial support. Consideration may be given to the urgency of garbage disposal needs, the amount and costs of environmental protection, the short-term and long-term plans for community growth and development, and other pressing community needs. It is in this area, where tight resources must be strictly allocated, that private enterprise is often called upon to provide long-term solid waste management solutions.

## II- PRIVATE ENTERPRISE

### STANDARDS FOR INVESTMENT

Private enterprise looks towards the profitability of each of its operations. In the allocation of capital investment, a private enterprise will focus on creating the highest return for its investors. Among the projects under consideration for investment, those projects with the highest rates of return and the lowest risk will be afforded the highest priority in terms of the commitment of personnel and capital. Within the waste management industry, the prospect of achieving adequate returns is weighted against the risk of completion of projects through several phases, including conceptual planning, design, construction and operation.

A normal solid waste landfill project may proceed over a period of three to five years between the conceptual planning stage and the operational stage. The facility may operate over a period in excess of 20 years. It is only at the time that a landfill becomes operational that a return on the investment commences. Throughout the planning, design and construction phases, private enterprise will seek the best assurances that the investment being made in time, personnel and capital will produce the results intended. Private enterprise will then look to the economic and governmental environments of particular countries to determine the risk attendant to investments within that country. With higher risks of successful completion of the solid waste management project, there will be higher expectations of return on investment.

### III- CONCEPTUAL PLANNING PHASE

At the conceptual planning phase of landfill projects, private enterprise is making a determination of whether an adequate infrastructure exists in the region or community for the support of the landfill operation. The conceptual planning phase would review the investment and regulatory climates, define the waste stream characteristics and delineate the various methods of addressing waste disposal needs. The conceptual planning phase is implemented within the legislative and regulatory framework for environmentally sound solid waste management programs. Therefore, in order to assess the conceptual viability of the project, private enterprise would look to the assistance of the governmental authorities in the following areas:

#### FOREIGN INVESTMENT REGULATIONS

In light of the capital development costs which are incurred, private enterprise seeks a high degree of certainty that the country, region or community can assure methods of payments and provide mechanisms for the return of the capital invested. In addition, the stability of the currency of the country, coupled with treaty provisions for repatriation of funds, enables private enterprise to justify its capital commitments to governments and financing institutions. Therefore, private enterprise would look towards the government for the establishment of a legal framework which provides clarity, certainty and permanence in its treatment of foreign investments. Not only is this framework essential to private enterprise, but it is also applicable to capital, financing and technical support provided by international financial development corporations.

The need for foreign investment regulations is apparent when the scope of the landfill project is converted to dollars. Capital costs through the design and initial construction phases alone may exceed several million dollars. These capital costs may be viewed as the initial capital expenses required to achieve operational status. In general, these costs include siting, permitting and initial construction costs. In particular, the following expenses are incurred: legal expenses, land acquisition, scientific studies, engineering and permitting, facility construction, monitoring wells, leachate management facilities, gas management facilities, initial disposal area construction, and access road construction. Throughout the life of the project, in excess of \$10 million may be invested.

## **REGULATORY STANDARDS**

Private enterprise would look to the governing authorities for the establishment of a regulatory framework under which the design, construction and operation of solid waste disposal facilities would be conducted. The regulatory environment provides essential guidance on the standards to which the commercial enterprise will be held. Should the regulations require the use and installation of the best available technology for the handling of the waste stream, private enterprise will be able to plan the amount of capital that is required for commitment to the project, and accordingly can determine the rates of return sufficient to support such investment.

With the substantial amounts of capital required for the establishment of the facility, private enterprise will also be looking towards consistency in the governmental approach to regulations. Should Private Enterprise make a large capital commitment, only later to find that the regulations have made the investment obsolete any further investment will be questioned if not curtailed. Therefore, it is essential that a regulatory framework is established to address the waste needs on a long-term basis. Without the commitment to the certainty created by effective regulation, private enterprise would hesitate to dedicate the capital and resources necessary to bring a landfill project to completion.

Within the regulatory framework, private enterprise would look to governmental assistance in the establishment of guidelines in critical areas. The regulations would encompass the provisions for access to the site in terms of road access sufficient to serve the community as well as to provide efficient truck routing. On the site itself, the regulations should encompass the control of odors, control of gas generated by the decomposition of solid wastes and the control of leachate, which is formed as water migrates through the wastes. In order to avoid air traffic accidents from foreign object damages to planes, regulations should be established restricting the siting of facilities in close proximity to air field operations. The regulations of the actual operations at the site, for example the requirement that wastes be covered on a daily basis, will assist in controlling fire and odor problems at the facility. Regulations requiring a design which avoids the accumulation of standing water will assist in the control of insect breeding grounds, and those regulations dealing with surface water containment will similarly prevent mosquito and fly infestation. The daily compacting and covering of waste with minimal layers of soil will also eliminate the potential or rodent infestation.

## **ENFORCEMENT STANDARDS**

Coupled with the establishment of a regulatory framework, private enterprise will look towards a level of commitment on the part of governmental authorities to enforce the regulations that have been established.

On the basis of the regulatory environment, private enterprise may determine that an expenditure of \$10 million is required to install appropriate technology at the facility, and

accordingly will determine that the project provides sufficient returns within a pricing structure of \$15 per ton for waste disposed at the facility. It may well be that private enterprise has determined that it is necessary to obtain 800 tons per day in order to maintain a price of \$15 per ton.

Should the enforcement be lacking for proper disposal, private enterprise may quickly find that, rather than disposing at the landfill at \$15 per ton, the citizens of private operators will use open dumping practices. An open dump is a place where solid waste is dumped directly into or onto the ground, with no safeguards protecting the environment and public health. Needless to say, open dumping is done without any environmental safeguards and can readily divert waste flow from going to the landfill facility.

In instances where the illegal dumping of waste occurs, the tonnage received at the facility may drop dramatically from the required level of 800 tons per day, to less than 100 tons per day, jeopardizing the financial continuation of the operation. For this reason, landfill project financing is often supported by contracts to deliver required volumes of waste at established prices ("put-or-pay" contracts). In the absence of put-or-pay contracts, the enforcement of waste flow into the facility is mandated by governmental regulation. Without enforcement, illegal dumping will quickly cause the financial failure of the landfill facility and create defaults on the repayment of funds advanced towards the construction and operation of the facility.

#### **WASTE CHARACTERIZATION**

At the conceptual planning phase, private enterprise will also seek the assistance of regulatory authorities in identifying the character of the waste stream being generated. During this process, an effort is made to define the quantity, composition and bulk density of the solid waste being generated within a region or municipal area. This information is critical for assessing the effectiveness of the current waste management systems and evaluating the feasibility of alternate approaches.

Private enterprise, if equipped with this critical information, may expedite the design of alternate waste disposal solutions. In the event that the information is not readily available, the private enterprise requires the assistance of the government in obtaining and generating data. In a standard approach, a project team would draw upon the data reported in literature, for Morocco and for countries with similarly situated demographic data. For example, the U.S. AID Report (1984) on solid waste generation in Morocco indicated that daily waste generation in Casablanca was approximately 0.5 kilograms per person. Such a waste generation rate is consistent with the World Bank Report (1982) on solid waste management in developing countries. While the published data provides some indications of the waste streams, it is essential that the published data be supplemented with current information and classification of the types of waste produced.

Waste to be identified and quantified would include the following source types: residential, commercial, institutional, construction and demolition, sewage sludge, compostable wastes, ash residue (industrial by-products), hazardous wastes, and medical wastes.

The identification of the types of waste assists in facility design. For example, the existence of nitrogen-rich manures in the waste stream would lead to consideration of the installation of composting technology. Hazardous waste sources would indicate a need to segregate the disposal of hazardous and non-hazardous materials, since the non-hazardous material can be landfilled more economically in area segregated from the hazardous material. The existence of larger amounts of construction and demolition of a Material Recovery Facility could be advantageous due to the resale markets for iron and aluminum scrap. With a large concentration of disposed paper product, the separation and resale of such materials is economically feasible. In any event, it is prudent to design and construct areas within the facilities to provide for the recovery of such waste streams at the inception of the project. In addition, the identification of the quality of the waste stream will provide a basis for determining the optimum equipment for landfill operation and design.

#### **IV- DESIGN AND CONSTRUCTION PHASES**

##### **SITING CRITERIA**

Having assessed the economic viability of an integrated waste management system, private enterprise is next benefitted by government agencies and information provided by governmental sources in siting a facility. In a perfect society, private enterprise would select a site for the disposal facility that is best suited for protecting the environment. Often however, non-technical issues override the technical selection of a site, with adverse community reaction driving decisions to locate sites in other than optimal locations. With respect to the siting process, one or more locations are initially considered. These potential sites are identified based on technical feasibility and are aimed at minimizing negative environmental impacts. Regardless of whether the site is politically or socially favorable, it is imperative that the site be technically and environmentally sound.

Once several potential sites have been identified, preference and exclusionary criteria must be evaluated and used to select a single site that is most favorable for development. Preference criteria include access to public roads, social impact on neighboring landowners, proximity to residential development, current land use, and other issues of this nature. A preference criteria is simply a set of standards which identify more or less favorable characteristics of the site, but do not preclude the site. Exclusionary factors include the proximity to airports, the presence of rivers, lakes, and other water courses, the proximity to drinking water supply wells and other water sources. Governmental assistance is essential in balancing the community and enterprise objective in the site selection process.

##### **TECHNICAL CRITERIA**

As an integral part of the site selection process, the preliminary evaluation will address the geotechnical, hydrological and engineering aspects of the site. This objective evaluation determines the technical merit of the site, regardless of other concerns. Ultimately, site selection must balance both technical criteria and public and regulatory concerns. The site

eventually selected must, through actual conditions and design, be viable from both technical and political view points.

Private enterprise would be greatly assisted by the governmental resources in both the siting and technical criteria process. The existence of the following materials is invaluable:

1. Area maps and population density
2. Property maps and legal descriptions
3. Flood plain maps
4. Rights-of-Way, Easement and Mineral Rights identifications
5. General and Site Specific Groundwater Data
6. General and Site Specific Soils Data
7. Area Drinking Water Supply Information
8. Watercourse and aquifer descriptions

In the event that the foregoing information has not been compiled, governmental assistance is essential, both in providing personnel and in obtaining access, for the gathering of the information.

#### V- OPERATIONAL PHASE

Once the initial site construction is completed and the site is ready to receive waste, revenue is generated to offset the costs of capital development, as well as ongoing maintenance and operations. Operations and maintenance costs are incurred on a daily basis account for employee salaries and benefits, equipment, fuel and maintenance, utilities, road repair and grading, equipment replacement for pumps and wells, and other costs related to ongoing waste disposal activities.

Private enterprise would, in this area, look for substantial local support for the operations of the landfill facilities. While the following items are not meant to be an all-inclusive list, they are representative of the needs of private enterprise at the operational phase.

#### LABOR FORCE REQUIREMENTS

In the first instance, private enterprise would look to governmental assistance for the identification and selection of a labor force for operations of the facility. The existence of a qualified staff is of great benefits in the evaluation of the project. A landfill operating at the level of 2,000 tons per day would normally employ 40 to 60 workers, including 10 administrative personnel, 10 equipment operators, 5 equipment maintenance personnel, 5 facility and construction engineers, 10 facility maintenance and inspection personnel and other additional laborers. With the existence of a qualified labor force, the viability of the project is increased.

#### TRAINING AND EDUCATIONAL FACILITIES

While private enterprise will often provide facilities for training and education of the labor force, it is a benefit to the viability of the project that a strong local education system is in place. Further, the endorsement of support by governmental authorities of training and education programs insures the continuation of a strong labor force over the long life of the landfill facility.

#### **EQUIPMENT AND SUPPLY CAPACITY**

Given the needs of the landfill facility for replacement of equipment and the supplies needed for repair and maintenance, the existence of a strong industrial and commercial network of enterprises is of significant benefit to the landfill operation. A significant disruption of operations at the landfill due to lack of replacement parts or the failure of fuel and lubricant supply routes can adversely affect the economic viability of the operations.

#### **VI- SUMMARY**

While time does not permit discussion of each of the multiple phases of an environmentally sound solid waste disposal facility, the major considerations influencing a decision by private enterprise to engage in such a project have been set forth. A state-of-the-art landfill involves substantial commitment of time and resources by private enterprise. As demonstrated in this review, an equally strong commitment is required of the government for successful completion of a landfill project. Private enterprise, working jointly with governmental authorities, can assure itself of adequate returns on its investment. At the same time, the government, through its sponsorship of essential programs, can assure the health and safety of its citizens and the competitive position of its domestic industries.

## DISCUSSION FOLLOWING PRESENTATIONS BY DONOVAN, AMANI, DE LARUE AND RODGERS

### Mr. DJERRARI, DIRECTOR GENERAL

I will briefly speak of the role played by the Autonomous Distribution Authorities in the waste disposal field in Morocco.

At the level of liquid waste disposal, there is a governmental decision consisting of transferring to the municipal distribution Authorities the liquid waste networks which, in fact, are emanations from the Local Community. The Urban Community of Rabat owns a thirty year old composting plant which has a treatment capacity of 200 metric tons a day and produces compost used in agriculture. This is a plant we manage for Rabat which retains the responsibility for investment and the outcome of the operation. The annual compost production is 35,000 metric tons. The plant runs with about thirty agents and a turnover in the order of 2 million dirhams in expenditures, 35% to 40% of which are recovered in the form of compost with the remainder being the city's responsibility.

### Comment by Mr. BEKKHOUCHE (Oujda)

In Morocco, there are several constraints to household waste management. In addition to the mentality of the people, the urban fabric is woven with anarchy, especially in the slums and clandestine habitat which represent a far from negligible proportion. In order to privatize, it is necessary to begin with a pilot program, selecting one, two, or three cities in which the private sector manages certain areas while leaving the others to the municipality. The assessment of this operation can be made when we meet again.

### Mr. TAHIRI

Mr. DONOVAN talked about the sanctions which could be taken against waste disposal companies insofar as these companies do not faithfully observe the contract. I think that the term "sanction" is too strong, because it is necessary to go into the needs of the companies which in turn experience problems during the operation at the level of the application of the specifications. For this reason, what is true for the municipality can also be true for society. Privatization must be encouraged in this spirit and in this sense. I will deal with the urban transportation case, and we will see that the application of the specifications experiences problems which occur within both the department granting the concession as well as the one receiving it (i.e. the private company.) This is why the word "sanction" is a harsh word. On the one hand, dialogue can be discussed during the

application of the contract; on the other hand, I think that, in order to encourage the experience, the municipality must show a continuous soundness and collaboration spirit on a regular basis. Measures must always be taken to ease the operation and the exercise. I would even say that "specifications" and "privatization" are paradoxes.

Question: Mr. Harry BIRNHOLZ (USAID)

I would like to ask the RED Director whether he could tell us about the Authority's experience in the management of the composting plant. Do you see any future in this area of the private sector?

Answer: DJERRARI

The composting plant is a sorting station as well, but there are no major outlets for the sorted products, namely iron.

As regards cardboard and rags, we have noticed that there is a pre-collection at the level of the waste collection staff. We accept very little glass, not to say that it is non-existent (a good thing for agriculture). We accept very little plastic in the form of polyethylene. The plant does not accept any thick plastic. Only PVC gets to the plant level because it has commercial value. We categorically refuse cardboard, wood, and rags. We do accept a large amount of plastics in the form of film (bags) which cannot be eliminated due to the plant design (grinding, sifting.) As for the profitability of the plant, our clients are the produce growers of the Rabat area. The situation is so competitive that when we asked 80 dirhams (DH) a metric ton for compost, we could not sell it because of the competition from fresh garbage. Marketing the latter has slowed thanks to the elected officials' attitude of the Rabat-Salé area and we have since been able to market this compost. The cost price is 80 DH per ton of compost. At present, we market it at 25 DH per ton (leaving the plant). I personally feel that by asking 40 DH we could sell this product without any problem since we are now the object of permanent requests and we cannot meet the demand. The demand is at least double that of the offer we can make at present (200 tons a day). I also know that farmers in the Souss (Agadir) area are interested in our compost.

Mr. DE LA RUE

When there is pre-collection, there is informal industry. Consequently, there is a market for recycling. This is my first statement.

Second statement: in the recycling units we are planning, we do not ask for any government subsidy and we will invest with our partners; in addition, we have pre-feasibility studies showing it is profitable. As an example, the break even point of a plastic recycling plant is 800 tons a day for which it is relatively simple to obtain supplies. Beyond that, it is profitable. Glass plants are profitable as well. In the El Jadida mixed corporation, we are planning to create not only small businesses but also micro-businesses.

There are many examples around the world which demonstrate the profitability of micro-business and USAID must have examples of worthwhile realizations -- IBRD has some, and so does UNDP. In summary, I think that it is important to perhaps inventory the successes in the world. In fact, there is too much talk about failures -- the compost failure was mentioned, but there are compost successes as well.

Question: Mr. BIRNHOLZ

It seems to me that, as regards recycling or composting, the choice of such techniques in the USA or in European countries is justified by the constraints connected mostly to the availability of land near cities. On the other hand, in Morocco, the question of land is moot, at least to the same extent as in the countries given as models.

Answer: Mr. DJERRARI

As regards the problem of the availability of land, there is no evidence of always finding land which meets the following criteria:

- proximity
- dominant winds
- any problem with regard to the groundwater table and the levels
- cost
- nuisances to the population.

If you have a site, in practically the heart of the city, which will be used for composting, the savings you will realize on the transportation of urban waste to a landfill located 20 to 30 kilometers away would definitely cover the composting cost. As regards the regional economy, you will deliver a product which plays the same role as manure. In the absence of compost, manure would perhaps be double or triple its present cost.

Mr. DE LA RUE

We often mention the financial cost of the project; we must set the costs in a global context which integrates the "Environment" component. In many countries, the tables are de-polluted at a very high cost.

As for the landfill sites, there is no ideal site; we always talk about the least worse site. The solution to the transportation problem is in the implantation of transfer centers.

**Comment: Mr. DJERRARI**

I wish to go back to Mr. DONOVAN's lecture regarding the remuneration base for household waste collection and treatment benefits. Mr. DONOVAN spoke of a remuneration based on the collected ton or cubic meter, the number of inhabitants or families, etc..

Mr. JACQUES FAUCHER from the Paris area told me that, speaking for himself, remuneration should be according to a contract with a global result (at the collection level.) He is not scheduled to speak in this program, but he still can give an overview of the contract.

**Mr. JACQUES FAUCHER, Service Urban Corporation (SITA)**

We have contracts in the Paris area which are result-oriented global contracts, that is, the remuneration system is an annual lump sum which does involve the implementation of specific means; but the contract simply says: "you are partners in the city, we want to see a result, meaning that the household waste collection must be done under the best conditions and you assume the cleaning duties of the city without any material or personnel constraint. This means that the company sets up the necessary staff to face the task incumbent upon it."

Every day, materials which differ from the point of view of quality as well as quantity are used. Some days, a more thorough washing is needed. There are days when more vacuum sweepings are implemented. On certain days of the week, it is necessary to send more collection trucks. These are difficult contracts to carry out but they rest on a straightforward conference between the community and the private company. Of course, this does not take place around a table. There is a call for bids, several companies respond with a cost proposal. The Community then chooses the company which appears to be in the best position to ensure the best warranties. If the inhabitants and the elected officials are not satisfied, the contract can be very rapidly brought to an end.

**Question: Mr. BERRADA (USAID)**

My question is directed to the RED Director : you talked about your experience in the Rabat UTOM and the Local Communities policy with regard to the transfer of liquid waste disposal to government controlled companies. Do you think that the household waste services run the same risk of suffering the same policy. In the specific case of Rabat, what are the conditions with regard to a your Authority taking charge again from collection to treatment?

**Answer: Mr. DJERRARI**

The Moroccan Government has decided to opt for a new form of liquid waste disposal management. Until now, management was municipal, often not individualized. We wanted to grant this sector the importance it deserves. In this respect, instead of making it an administrative management, we wanted to use business logic in managing it, with budgets, credits and debits, and an adequate cost recovery according to investments to be implemented. The "transfer to Authorities" option is an option which has a certain number of advantages and merits. The former consists of saying that in fact disposal enters the water cycle. Pricing according to the number of cubic meters used seems to be commonly accepted. Authorities also manage the roads and underground (public lighting cables, AEP networks). The decision to transfer is not irreversible, and anyway it has not been taken everywhere in Morocco. The door remains open to the municipalities so that they can opt for the choices they wish in function of the Municipal charter. Nothing stands in the way of creating mixed economy corporations for municipal services management or private corporations, or opting for other forms of management. As for collection, it is not 100% done; there is solid waste in the sewers. It is then necessary to couple both disposal services (liquid and solid.) Until now, I do not know of any city that has decided to transfer the solid waste services to Authorities. There were some thoughts about Rabat, but the idea was not encouraged, either by the Authority or the elected officials. Managing the plant is akin to an industrial process which finds its niche far better in a distribution Authority than in a municipality.

#### Mr. HIROUF

I will add to what Mr. President said that the waste disposal transfer to a distribution Authority is first and foremost dependent on what the elected officials want to do, the council of the urban community in a specific framework given the enormous investments necessitated by the patching up of the network and its rehabilitation. Negotiations with the World Bank have made it necessary to "transfer" to an Authority which is better organized to manage this service. The distribution Authority is an Authority controlled by the Municipality and answers directly to the elected officials through a board of directors. This said, there has to be a limit to "palming off" everything to the Authority. We must not find ourselves faced with gigantic autonomous Authorities which themselves are the brunt of criticisms from the citizens with regard to their productivity and service quality. In my opinion, and in our country's ethic of bolstering democratic structures, it is time that the municipal entities solve their own problems instead of transferring them, which does not prevent the elected officials from deciding on privatization.

#### Mr. DE LA RUE

If the World Bank insists on transferring the waste disposal sector to the Authorities, it is because these are better equipped to tax. At present, several countries are thinking about the taxation system. e.g. taxing household waste directly by a tax on water or electricity. In this context, a small remark was made with regard to our talk in EL Jadida. We are

wondering whether we are going to go as far as privatizing the various circuits; each truck would be the property of a driver with 2 or 3 employees, and there would be a venture capital company which would finance this operation. One could even grant concessions for the sweeping of one or two kilometers of streets. If we discuss privatization, the companies which enter privatization do so for profit, and if all the municipalities understand that the private company entering the privatization system with them must make a profit, this discussion will be simple. Private enterprise does not enter privatization to lose money or to provide welfare. It would be total hypocrisy on the contractors' part to say: we are coming for the benefit of the municipality. We come to make a profit.

**RESPONSABILITIES OF THE PRIVATE SECTOR IN THE  
COLLECTION AND TREATMENT OF URBAN SOLID WASTE:  
A PERSPECTIVE.FROM THE PRIVATE SECTOR**

presented by

**Dr. Molina Fajardo, representing Mr. Carlos B. Bejumea,  
President, BFI-Spain**

**THE PROBLEM**

Currently, the development of a country cannot be measured solely in socio-economic terms and it is increasingly necessary to take into consideration other elements among which the environment undoubtedly plays a prominent role. Indeed, there exists nowadays a special sensitivity towards the environment and the impact that man's activities upon his habitat can have on the environment.

As we near the end of this century, environmental problems are one of the main types of issues that confront mankind and also world leaders in taking up this challenge: offering all mankind a better quality of life.

Nowadays, concern over the environment is shown in the implementation of procedures designed to try to avoid or minimize the risks and the harm that different activities carried out by man on land and underground can mean for the environment. The most notable and important procedures are assessments of environmental impact.

Traditionally, municipal governments have been responsible for the management, collection and disposal of urban solid waste. Even though ancient civilizations used disposal methods such as landfills and incineration, systematic collection and disposal of solid waste was not common even in the most important cities in the world, until the middle of the nineteenth century. However, modern society must have an adequate plan for the management of urban solid waste. The amount of solid urban waste has increased continuously since the beginning of this century. This fact, together with the economic benefits that can be obtained from the collection of waste and its impact on the environment and public health demonstrates the need for planning and organizing the resources at hand, strategically selecting the sites for the different operations and setting objectives in coordination with other management spheres.

It is becoming obvious that the management of urban solid waste, due to its current complexity and its impact on the environment, is an issue that requires a high level of specialized management skills which many municipal governments do not have. This is mainly due to the fact that the management of urban solid waste is a cycle that does not end

simply with the collection and disposal in a landfill but rather that encompasses processes such as pre-treatment, transportation, transfer, and treatment for disposal or utilization. This set of complex processes requires a specialized management cycle and new territorial boundaries that are often larger than that of the municipality. Moreover, the important economic investments that an efficient management cycle would require encourage the contribution of specialized private sector initiatives in cooperation with the public sector and alternative initiatives at state level in cooperation with local government agencies.

#### MUNICIPAL MANAGEMENT THROUGH PRIVATE SECTOR INITIATIVES

There is a clear tendency on the part of industrialized countries to have municipal governments contract out public services, ranging from water supply to the collection and disposal of refuse, clean-up services, sanitation, fire services, urban transportation, sewage water treatment and others.

The services rendered is due to the transfer of jobs from the public sector to the private sector by means of contractual franchise agreements and under strict administrative control.

Up to a few years ago, only centers with large populations were concerned with the collection and disposal of solid waste that was generated in their municipalities. Nowadays, concern about management of urban solid waste has become so generalized that the disposal of refuse is a serious technical, socio-economic and environmental problem for most local governments. This problem will become much more serious in towns located in tourist areas in the heartland and in coastal areas, where there is a large influx of tourists during certain times of the year that is much larger than the local population. In many tourist or summer resorts, the refuse generated by the seasonal population can represent a volume five times larger than that produced by the resident population during the rest of the year.

The steps taken to finance this public service by means of adequate local tariffs and fees are specially important because the key problem is precisely the availability of economic resources.

#### ADVANTAGES OF PRIVATE SECTOR INITIATIVES

It would be beleaguering the obvious to state that the private sector is not out to lose money and it would be even more naive to conclude that the municipal governments need private sector initiatives only to finance investments and to give financial support to the management of municipal services. The privatization of these services produces advantages over and above the purely financial.

In the first place, the quality of the service provided in private sector initiatives in relation to its cost is much higher than under the public sector due to a variety of personal and organization factors. We must take into account the fact that the services of collecting of solid urban waste and cleaning public thoroughfares under public sector management are not highly mechanized at present and are mostly made up of municipal employees who, if

they are not motivated with regard to productivity, would just increase the cost of the service but not its quality. Without a doubt, private enterprise will motivate its employees financially, in direct proportion to their productivity in a more efficient fashion than the municipal government.

As we have repeatedly pointed out, we must not forget that nowadays, the complexity of the problem requires high management capability and increased specialization, so that the higher cost of solid waste disposal and the resulting investments in time become profitable for the community. It is not necessary to make a large initial investment, but the investment should be sufficient to allow for the periodic amortization of the investment without need for further investments during that amortization period. This can only be achieved by means of clear, comprehensive and coordinated objectives in cooperation with the municipal government. The following example may illustrate the lack of sensitivity on the part of municipal governments with regards to the needs of private citizens.

In a certain city with a population of 100,000, the municipal government decided to dispose of solid waste by using a facility to transform solid waste into organic compost. Even though the initial investment would be very high, this plan would avoid maintaining a garbage dump on the outskirts of the city.

The government loan which was granted for the project was not sufficient to cover its total cost. Consequently, the construction of a small incinerator furnace to eliminate the residual product left over after waste treatment was not completed. Thus, the garbage dump which was to be closed was reopened for waste disposal. The organic compost resulting from waste treatment, which the municipal authorities planned to sell to farmers in the region in order to cover the cost of the initial investment, was not as successful as expected because the farmers in the area used irrigation land cultivation and, as they were accustomed to working barefoot, the glass residue contained in the compost did not allow them to perform their job properly. The resultant accumulation of waste precluded the adequate treatment of the garbage which was collected on a daily basis and, as a result, the municipal government was forced to put an end to the project, closing down the treatment facility and relying once again on the garbage dump for waste disposal. Nevertheless, once the investment had been made the municipal government was forced to repay the loan annually until its maturity.

#### PRIVATE SECTOR INCENTIVES

In our opinion, there is only one successful and realistic way in which to resolve the problem of urban solid waste, with regard to its collection as well as its treatment or disposal, which is to carry out an exhaustive study of the real service costs and pass them on directly to the users. This means applying the principle that whoever pollutes pays for it.

The cost of collection and disposal of solid waste is quite high. In general, the municipal governments cannot cover the real cost of the service with the income from collection fees, which results in a deficit that has negative consequences not only with regard to the service provided but also with regard to the effect the waste has on the environment.

If the municipal governments were wealthy and if they had adequate financial resources the problem would cease to exist and almost certainly would have been resolved in almost all municipalities even though this issue was first raised quite recently. But in reality, the problem has not been resolved in most places, a situation which is surely due to financial issues as there are many sound technical solutions.

We wish to reiterate that if the collection and disposal of solid waste becomes very costly for the municipal governments, they must be prepared to pay for these services by means of other revenue so as to balance expenditure and income. This issue must be resolved by applying the principle of "whoever pollutes pays for it", so that those who produce the waste pay for it directly through service fees. The municipal governments must collect the service fees as part of their management functions, with the option of carrying out the waste management plan on their own or contracting out to a private company but conditioning the contract so that the municipal government would still be responsible for controlling the management plan.

The private sector will not undertake the management of this service unless there is a clear guarantee that the real service costs will be covered. If this guarantee is forthcoming, there should be no difficulty in getting private companies to make the initial and most important investments as they will recover their investments according to the repayment plan that was agreed upon.

The real solution lies in the acquisition of public or private sector loans allowing for the appropriate investments. These loans should be requested and private sector investments obtained, only after the municipal government has resolved the problem of collecting sufficient dues or fees to repay the outstanding loans and also to totally cover the operating expenses. Under these terms, the municipal government would be able to obtain the loans it needs because repayment is guaranteed and the expenditure incurred would be covered.

When a municipal government or group of local governments needs to solve the problem of collecting and disposing of solid waste in its area in an orderly and rational manner, the first step is to establish a solid waste management plan that, despite its long title can be very simple or very complex, partial or comprehensive. It is always more convenient to ponder over solutions to the problem than to make quick decisions.

In the first place, it is necessary to know the full extent of the different types of waste in the municipality or in the area. The first part of the plan will encompass collecting information and preparing an inventory of types of waste.

After this initial analysis has been completed, a more adequate waste disposal system could be adopted, by first considering the different alternatives and then selecting the most appropriate.

Once the technical aspects of the problem have been resolved, the key issue of the management plan, funding, comes into focus: the matching of income with the operating cost of the service.

We want to point once again, that it is increasingly necessary to provide public services by charging real costs, that is to say, setting collection and disposal fees at a level that is sufficient to cover the cost of the service provided. This is the only way to ensure an efficient and environmentally safe service because, without adequate and continued funding of the service, all the technologies, studies and good wishes in the world are futile.

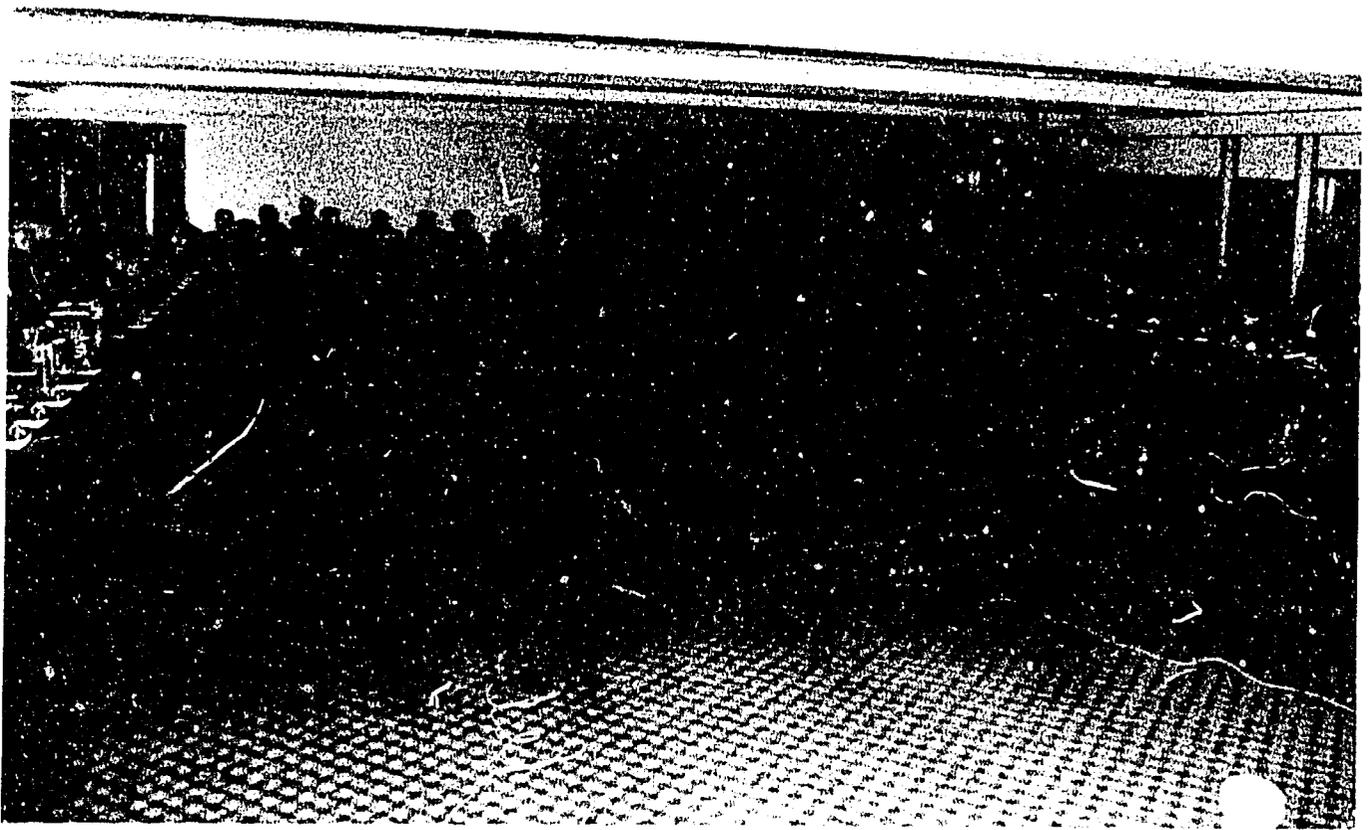
The only condition that the municipality must meet is that if it charges an appropriate fee, it will be obliged to provide an efficient service.

So as to provide a dependable service, the municipal government must carry out a comprehensive study to optimize the entailed cost, to determine the quantity and types of collection vehicles to be used and to establish well defined routes for each vehicle. This will involve establishing routes and schedules that should be strictly followed. Another factor that must be taken into account is the maintenance of the vehicle fleet.

With regard to disposal techniques, it is important to remember that for a municipality or group of municipalities whose size and characteristics are equivalent to cities of 1,000 to 100,000 inhabitants, the most appropriate system is that of a landfill with strict sanitation controls.

Incineration systems are more costly and to be cost effective need to burn at least 500 metric tons per day. In this study, we have discussed the current situation and what can be expected to happen in the next five years. It is also true that the world's socio-economic evolution is accelerating and we are quickly moving towards new approaches and concepts with regard to the utilization of raw materials, energy retrieval and reduction of water consumption or the treatment of wastewater.

Thus, we can expect important changes and advances in environmental issues but nevertheless it is advisable to find adequate solutions and to be decisive in continuously implementing them, as they are what society nowadays requires, as part of our standard of living.



## **URBAN TRANSPORTATION: STRATEGIES AND PERSPECTIVES**

**presented by**

**Dr. Youssef Tahiri, Moroccan private entrepreneur**

Under His development strategy and in order to improve upon the quality of services provided to the citizenry, His Majesty the King, May God glorify Him, has decided to involve the private sector in operating mass transit lines in some cities of the Moroccan Kingdom.

Following this royal decision and in accordance with the main points outlined by His Majesty, numerous private companies have come forward to answer this proposal.

Today in Casablanca, there are 12 private companies working along with public agency R.A.T.C.

This experiment is in its inception and a partial assessment can already be made.

### **1) - NEED FOR COHESIVENESS BETWEEN URBAN PLANNING AND MASS TRANSIT PLAN.**

Fast urban growth, which is a development trend in the Greater Casablanca area, calls for extensive use of mass transit. However, selected patterns for urban development and construction of housing hubs create service delivery problems. There needs to be cohesiveness between urban planning and mass transit plans notwithstanding difficulties resulting from urban sprawl, which at times goes unchecked.

This quest for cohesiveness will dictate criteria and obligations in any future development strategy in order to provide in Casablanca, a major economic center, travelling flexibility both to the individual and to the population as a whole. Traditional patterns in the current transit system ought to be reviewed and adjusted in view of future transportation needs and minimizing traffic congestion is already a prerequisite for future economic growth. To this end, Casablanca could elect to:

- Broaden mass transit access with special emphasis on roadway development in order to promote and supplement current mass transit lines.
- Foster mass transit over private car use, the former becoming a safe, organized and quick transportation alternative in remote areas.

Such policies have had a dramatic impact on some metropolitan areas, namely Hong Kong, where as a result of other incentives for mass transit use, the number of cars stopped increasing and was even reduced by 20% over two years.

- Launch an awareness program to explain to each individual motorist first, the economic prejudice resulting from his contribution to congestion in areas already crowded and secondly, the waste of time and increased stress associated with traffic jams.
- Improve signalling capabilities in selecting advanced electronic systems (panels indicating congested areas, etc.)
- Take immediate action to encourage mass transit such as dedicating specific lanes to buses before intersections, special bus lanes in one-way streets going counter traffic on some street segments, right of way when reaching traffic lights, etc...

Taken together, in the future, these policies could give mass transit in Casablanca a label of quality due to operational reliability and standards defining safe speed and regular service.

## 2) - PRICING AND FINANCIAL INCENTIVES

Mass transit draws its support and durable development from the private sector as corporations view as a duty and an obligation to improve the image of this vital activity for the national economy.

Financial problems operators face are quite significant and in no measure comparable to those encountered by other public service providers or grantees. As an example, all operational costs are to be paid from fares alone. Considerable costs resulting from extensive recruiting, expensive rolling stock which often deteriorates in no time in spite of quality maintenance, high operational costs and tax obligations prevent any operator from reaching over the break-even point, no matter how sound management policies are. To assess this situation objectively, to preserve the future of this trade and to allow the private sector to keep its hopes up, pursue and consolidate these ventures, quick and efficient alternatives must be found for financing and pricing. One possible approach would be to adopt an "investment code for private operation of mass transit lines", which would be the matching public commitment to grant specific benefits to operators. These would mainly be financial and tax incentives that would allow private corporations receiving no state subsidies to enter into a profit-making cycle, covered against any financial loss. Preferential financing terms, such as lower commercial interest rates, may also be offered as is the case for housing projects deemed in the public interest.

Finally, pricing must be in keeping with costs to be borne by private operators. Regular adjustments are necessary to pass cost increases (for equipment, fuel, tires, taxes, etc...) on to current fares which must be above all cost-effective and then affordable.

These fare adjustments are justified by the significant contribution of mass transit to intra-city activities, i.e.:

- Smooth travel for corporate employees.

- Better exposure for commercial and industrial businesses resulting from increased clientele with added mobility.

Consequently, it is necessary to identify and implement policies that will allow mass transit operators to benefit from increased value-added activities as a result of mobility. To this end, two approaches may be considered:

- to grant some subsidies to private operators to offset extra cost incurred by line extension and to determine whether or not fees to be paid by operators are warranted given their contribution to society,
- special arrangements (route selection) must be granted to private operators taking into account corporate interests against a background of friendly business relationships with public agencies.

### 3) - TAX INCENTIVES TO PROMOTE BETTER TRANSPORTATION

Without requesting the creation of a support fund for mass transit as many other cities have done, it would be of vital importance to grant tax exemptions to private operators and, more specifically, to refrain from adding other taxes (sticker or axle tax) to current corporate tax obligations. Conversely, this "Investment Code for mass transit" would consider the future of this sector and service quality trends to be promoted and it would outline the complete range of services, price and fare structures, procurement and incentive policies.

### 4) - PLANNING AND SELECTED ACTION ON THE MARKET

Any mass transit policy, no matter how fine-tuned and firm, may be doomed if the corporation is faced with obstacles in daily business activities while fulfilling mandated obligations in good faith. Indeed, private companies are required to actively participate in basic programs outlined in their statements of work, and furthermore, compliance with grant contract terms are a prerequisite to ensure protection of the trade as well as current and future achievements in mass transit in Casablanca. But corporate management must become truly autonomous and able to participate in any traffic planning activity because these operators know what conditions are conducive to business on current and new markets to promote social and economic interests more generally.

Consequently, sound planning can no longer rely only on traditional marketing mechanisms or on meeting supply with demand, rather it becomes imperative to plan in view of non-economic factors.

More specifically, there is a need for coordinated implementation of economic, political and psychological resources as well as public relations campaigns to muster support for ensuring success.

**PRIVATIZATION OF MUNICIPAL SERVICES:  
THE MOROCCAN EXPERIENCE: A CASE STUDY IN MASS TRANSIT**

presented by

**Mr. Lahssen Hirouf, Member of the Casablanca  
Urban Community Council**

Moroccan local communities are both an outgrowth of ancestral democratic traditions but also the outcome of a long evolutionary process that anchors these institutions to daily experiences of the citizenry.

This process is characterized by the inevitable and permanent interaction between pragmatic and theoretical considerations and structured within a legal framework which is constantly being strengthened.

In the final analysis, the goal is to provide vital public services to the citizens taking into account the most immediate and pressing collective needs.

Consequently, municipal services went through several phases depending on to the most immediate and pressing collective needs.

Thus, in the first stage, institutions had to be set up and given adequate resources (personnel and equipment).

In the second phase, these resources had to be allocated to the most pressing tasks.

These two necessary but by no means final stages did correspond to the "Administrative" phase in the local community.

For some years now, faced with complex and various needs, municipal entities have entered in a decisive phase whereby the community acts as a true company driven to maximize its services and minimize its costs. For optimal action in other terms (in its widest meaning of course, i.e. from an economic, financial and social standpoint).

However, no resource is endless and the ever increasing need for public services is compelling municipal managers to find dynamic alternatives which are the only possible tools to respond to these necessities.

In this presentation, we will try to share with you Casablanca's experience where mass transit was partially privatized in view to solve intricate issues with overlapping economic, political, financial and social elements.

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Prior to addressing our subject, it is important to place the Casablanca urban community against the background of Moroccan local communities.

#### A-THE CASABLANCA URBAN COMMUNITY, AN INSTITUTION TO FURTHER CITY GROWTH

Within the administrative structure in Morocco, the City of Casablanca has always enjoyed a special status when compared to other urban areas in the Kingdom.

The rationale for a special focus on Casablanca on the part of public officials is that, since the beginning of the century, this town has consistently experienced a tremendous rate of growth in all areas.

The following data will illustrate the decisive role of this town in the country.

Casablanca hosts over 3,000,000 residents, 40% of the jobs, 55% of industrial entities disbursing 62% of the salaries, 75% of national goods transit through its harbor (2nd largest facility in Africa), and the City collects 55% of all corporate tax.

Consequently, Casablanca's derogatory status has been reconfirmed in 1976 with the creation of the Casablanca Urban Community (CUC) (Royal decree -- or "dahir" enacted into law no. 1-76-83, dated September 30, 1976). This is a public entity with financial autonomy.

Novel form of inter-community cooperation, more recent than the "syndicat de communes" (communities association) adopted in France since 1967, the Urban Community is an institution set up to solve specific issues in urban areas comprised of several communities.

Consequently now, inter-community issues involving the 15 following urban communities are CUC's responsibility:

Anfa, Maârif and Sidi Belyout in the Casa-Anfa Préfecture: Aïn Chock and Hay Hassani-Aïn Chock;

Aïn Sebaâ, Hay Mohammadi, Sidi Moumen and Roches Noires in the Hay Mohammadi-Aïn Sebaâ Préfecture;

Ben M'Sick and Sidi Othmane in the Ben M'Sick - Sidi Othmane Prefecture; Al Fida, El Méchouar and Mers-Sultan in the Derb Soltane - Al Fida Préfecture, and Sidi Bernoussi in the Sidi Bernoussi-Zénata Préfecture.

Inter-community cooperation will cover three major areas.

#### ROLES OF THE CUC

In the above-mentioned communities, the role of the CUC is to manage and coordinate, to represent and to redistribute resources.

## MANAGEMENT AND COORDINATION

The CUC now handles matters formerly under community jurisdiction. Article 59 of the 1976 community charter defines these areas as follows:

- Road signs and roadways, exclusive of road maintenance, intra-community access roads, shoulder and pavement surface repairs;
- Utilities (water and power);
- Mass transit;
- Installation and management of cold storage facilities;
- Sanitation, exclusive of work to connect individuals to main;
- Garbage collection and disposal;
- Street lighting exclusive of maintenance and light work for intra-community access roads;
- Public parks, exclusive of community-specific works;
- Establishment, maintenance and management of slaughterhouses and wholesale markets.
- Inter-community Boards ("Régies"), corporations and companies.
- Land use program.

Apart from roadway maintenance and street lighting, these attributions have led to the implementation of major projects, i.e. the Mohammed V Sports Center, the Tennis Center, the produce wholesale market, attraction and city parks, etc.

Other projects just as important are already underway or in the planning stages: slaughterhouses, road-terminals, 250 acres slated for recreational use, a gift from His Majesty the King to the CUC;

In this respect, CUC's contribution in implementing the land use and urban master plan can not be denied.

These various powers granted by law may be extended by Council decision with the approval of relevant community councils.

Moreover, some other responsibilities, namely education, training and public health which are traditionally handled by the central government are being transferred to local communities.

Against this very background and through its budget commissioner ("Le Wali") the CUC has been directed to oversee the spending of 260 millions Dirhams (DH) out of a total of 470 million DH slated for upgrading and outfitting the IBN RACHID University Hospital (CHU).

## **THE ROLE OF REPRESENTATION**

As an indivisible organic entity, the City of Casablanca can not do without a speaker, a single representative so as to open itself to the outside world.

Therefore, one of CUC's responsibilities is to take into account the global interests of the town.

National, international, inter-community and inter-agency cooperation are special areas of such representation.

Since its inception, the CUC has steadily consolidated and developed cooperation efforts that the Council views as valuable and enriching given the exchange of experience and mutual benefits nationally and internationally.

Internationally, CASABLANCA has currently established sister-city relationships with about 10 foreign towns and it is planning 11 other partnerships. It is also a member of international associations such as the International Union of Cities and Local Communities, the Organization of African Towns, the Organization of Islamic Capital Cities and Towns, of Arab Cities, the World Organization of Large Cities (METROPOLIS) and the International Association of Mayors and Officials in completely or partially French-speaking Capitals Cities and Metropolises (AIMF).

Nationally, and in the same opening thrust, particularly towards academia, the CUC plans to enter into several cooperation agreements with various university departments, institutes and entities of higher learning. In this respect, a memorandum of understanding has already been signed with the Hassania School of Public Works and the Higher Institute of Commerce and Business Administration (ISCAE).

## **THE ROLE OF RESOURCE REDISTRIBUTION**

Faced with a deficit until 1986, the CUC had to wait until 1987 to fulfill its role adequately as its resources increased considerably.

In fact, infrastructure development and equipment acquisition for more than one community are supported by the CUC and paid from its own budget, when these works are deemed necessary or useful, whether beneficiaries contribute or not.

In this way, community action which focuses on large-scale operations within the so-called "impoverished" areas narrows the gap between rich and poor communities. Such is the case in the Ben M'Sick and Sidi Othmane communities, located in the southern part of the City where, thanks to CUC action, several economic ventures have been started, inter alia, a wholesale market for produce and cold-storage facilities.

In view of their physical and financial magnitude, these two ventures which are already operational have positive economic and social implications for the neighboring population.

Moreover, the construction of new slaughterhouses and several wholesale markets in the same area will further enhance these benefits.

To handle the three above-mentioned roles, the CUC, as any other institution, has set up an organization and various structures.

#### **THE CUC BOARD**

It is comprised of 101 members elected directly by the entire population and it includes urban community presidents (15) and deputies (86) of the Casablanca area.

The Board of Trustees is made up of one President and one deputy per community.

The following standing committees review the agenda of the Plenary Session of the Assembly either separately, (in view of their area of expertise) or together (in joint meetings): finance and equity committee, studies and works committee and finally, committee of social and cultural affairs and cooperation.

#### **CUC ORGANIZATIONAL STRUCTURE**

With substantial human resources (staff: 3,110 of which 116 senior administrative and technical managers, 732 mid-level managers and 2,262 low-level managers and unskilled manpower), the CUC has traditional management structures with newer employees, newer blood.

#### **TRADITIONAL MANAGEMENT STRUCTURES**

More specifically:

- a general Secretariat, which currently acts as a liaison between the Board and the CUC executive body, oversees the Board Secretariat, carries out regular or one-time studies, promotes international, national and inter-community cooperation and linkages with institutions of higher learning (university schools, Colleges, Institutes, etc...)
- various departments, the major ones being the linchpin of the institution, i.e.: the technical services division, the finance division and equipment and the personnel division;
- special services: health and animal sciences services;
- State controlled but privately managed industrial and commercial boards: cattle and poultry wholesale markets;
- Cultural, social or sports organizations: School of Fine Arts, Academy of Music, Library, Theater, Sports Centers, "Gouttes de Lait" Centers, "Dar El Kheir" Center and attraction parks;
- Public services with private management: Utilities (RAD), Mass Transit of Casablanca (RATC), Cold-storage facilities of Casablanca (RAFC).

## **NEW BLOOD: THE COMMUNITY COMPUTER CENTER (CICOM)**

With the joint Moroccan-Canadian project IMPACT (computerization of wholesale markets for a better business environment) as a foundation, the AIMF project (International Association of Mayors and Executives in towns and metropolises completely or partially French-speaking) started in August 1989 and operational November 14, 1991, global computerization of CUC structures is no longer a dream.

In fact, the three major departments already mentioned are about to be connected to the system which is expanding rapidly enough to expand shortly to the entire community.

Consequently, CICOM is soon becoming for the CUC a real tool for modern and rational urban management, allowing officials to make decisions wisely and citizens to have easy access to information and community public services.

Beyond the transfer of North-American technology, the purpose of the CICOM system is to promote new attitudes among various part

These were the specific objectives established by the CUC about two years ago; today, the gap between the CICOM and various services is narrowing.

At the same time the CICOM system is being implemented or shortly thereafter, one of the Board's priorities is to review the CUC organizational chart, in order to:

- spell out specific requirements for each position;
- review departmental structures;
- set up planning activities and make projections.

Following this brief description of our urban community which underlines how much the Board wishes to strengthen organizational structures to promote sound urban management, we will discuss our topic which is a top priority for the CUC board.

## **B- MASS TRANSIT BEFORE PRIVATIZATION:**

Three major characteristics:

- declining supply,
- financial shortages at RATC,
- discrepancy between land use objectives and actual opportunities in this field.

The following table will highlight declining supply in contrast to population growth in the City of Casablanca.

Year	Total fleet	Operational fleet. 70 %	Number of riders
1982	584	410	204.000.000
1983	548	380	219.000.000
1984	450	315	205.000.000
1985	550	385	190.000.000
1986	497	350	195.000.000
1987	479	335	200.000.000
1988	499	350	191.000.000
1989	463	325	185.000.000
1990	573	401	181.000.000

Not only did the number of riders not increase in keeping with population growth, but it went down.

There is no need to demonstrate that this sector, far from meeting demand both quantitatively and qualitatively, was facing a wider deficit that would bring about irreversible and insuperable difficulties.

Furthermore, shrinking mass transit capabilities were in conflict with and were impeding sound urban development as planned in the land use program. This program has promoted the development of new urban centers connected directly between themselves, bypassing the traditional downtown area.

Hard-pressed to cope with a problem of considerable magnitude, the representatives of the CASABLANCA Urban Community consistently warned the RATC Board in several meetings. At the time, the Board was also unable to remedy the situation in view of scarce financial resources and a barely balanced budget.

Against this background, stop-gap measures were no longer satisfactory moreover as these inadequacies created extensive hardship for the city residents.

## C- PUBLIC/PRIVATE PARTNERSHIP: A DYNAMIC ALTERNATIVE TO GROWING NEEDS

### BACKGROUND

National mass transit policy has been outlined in a Royal Speech dated August 7, 1984, delivered by His Majesty the KING HASSAN The Second to Casablanca officials.

The purpose was to associate the private sector to the operation of mass transit routes by way of concessions in order to provide a supplemental transportation service (and seated spaces) to RATC.

Contract terms for service management have been specified in a Statement of Work (See Appendix) and conventions binding these companies to the Casablanca Urban Community. This plan has been designed so as to minimize opportunities for mistakes.

Besides contractual terms governing transactions between the grantee and the grantor, a set of regulations was established to supervise operating conditions and protect the user (fare structure, transit zones and lines, maintenance requirements, technical inspections, etc.)

This mass transit model is self-regulatory in the sense that two transportation systems coexist with each other. Moreover, steps were taken to make sure that on any given line RATC and private buses were available.

### CURRENT RESULTS.

Private sector involvement not only contributed to reinforce mass transit capabilities and it also alleviated pressures on RATC services created by private demand. Besides, supply is now more diversified and the need for better service, both qualitatively and quantitatively is now taken into account.

#### A) SUPPORT SYSTEM FOR MASS TRANSIT

With the implementation of the program entitled "Public-Private Partnership" RATC transit capabilities have been supplemented by 220 buses put into use by four grantees as of July 1985.

Consequently, mass transit capabilities increased by more than 80%. The ratio between residents and operational vehicles went down from 5,400 to 4,050, improving by 25%.

These positive results have promoted mass transit development further.

Two years later, in June 1987, after additional negotiations, 8 more companies joined in. The total private fleet, not including RATC vehicles, increased to 650 units and consequently, there are now more than 1,000 mass transit vehicles in operation in Casablanca.

## **A P P E N D I X**

**\*\*\*\*\***

### **STATEMENT OF WORK**

#### **CONCESSION TO OPERATE PUBLIC BUS LINES WITHIN THE WILAYA OF GREATER CASABLANCA**

##### **A- GENERAL PROVISIONS**

###### **ARTICLE I:**

The concession agreement will be drawn up in accordance with the following statutes which become an integral part of said agreement:

- Decree no. 2. 76. 576 dated September 30, 1976 (in muslim calendar: Choual 5, 1396) governing accounting procedures in local communities and affiliated groupings.
- Decree no. 2. 76. 479 dated October 14, 1976 (Choual 1, 1396) pertaining to public procurement for various works, supplies or services.
- Decree no. 2. 64. 384 dated September 22, 1984 (Joumada I, 1884) pertaining to community state-controlled corporations with private legal status and self-financing authority.
- Royal decree ("dahir") no. 1. 59. 271 dated April 14, 1960 (Choual 17, 1379) outlining public financial control mechanisms over state boards, public entities and private grant holders as well as companies and organizations receiving financial support from the State or public entities.
- Royal decree no. 1. 161. 402 dated June 30, 1962 (Moharrem 27, 1382) amending dahir no. 1. 59. 271 dated April 14, 1960 (Choual 17, 1379).

- Royal decree no. 1. 62. 113 dated July 19, 1962 (Safar 16, 1382) governing personnel status in various companies.
- Royal decree no. 1. 69. 100 dated October 20, 1969 (Chaâbane 8, 1389) pertaining to mandatory insurance coverage for vehicles in use.
- Decree no. 242. 64 issued by the Ministry of Internal Affairs on January 12, 1965 endorsing a deliberation from the Casablanca City Council to create a "Régie Autonome des Transports en Commun de Casablanca (RATC)".
- Set of general administrative provisions sanctioned by royal decree no. 209. 65 dated October 19, 1965 (Joumada II, 1395) applicable to all public agencies pursuant to royal decree no.151.66 dated June 18, 1966 (Safar 29, 1386).
- Statement of Work of the "Régie Autonome des Transports en Commun de Casablanca" (RATC).
- Statement of Common Obligations (C.P.C.) as defined in a circular from the Ministry of Public Works and Communications no.6019/TPC dated June 7, 1972.
- Statement of Work
- Proposals (bid document) originating from the grant holder.

Furthermore, the grant holder shall abide by current legal provisions governing mass transit and regulations pertaining to traffic in urban areas.

#### **ARTICLE 2: CONTRACTING PARTIES**

As public representative, the grantor shall be the Wali of Greater Casablanca.

The company or companies selected by the public agency shall be represented by their directors or duly designated representatives.

Bid appraisal to select one or more grant holders will be based on the following criteria:

- 1) to be member of the mass transit trade
- 2) technical skills
- 3) financial resources
- 4) best reputation.

The public agency reserves the right to assign one or several bus lines, one or several sets of bus lines to the selected company or companies.

#### **ARTICLE 3: PURPOSE OF THE COMPANY**

This Statement of Work shall promote mass transit by bus so as to strengthen the present network and establish new lines within the Wilaya of Greater Casablanca.

#### **ARTICLE 4: SERVICE AREA**

The service area shall include one hundred and seventeen lines broken down as follows:

- City of Casablanca            102 lines
- City of Mohammedia        7 lines
- Rural areas                    8 lines
- TOTAL:                            117 lines

There will be a general review of each route prior to operation. This review will be recorded in an official report, to be reviewed independently by a Wilaya representative and the grantee.

#### **ARTICLE 5: TRANSIT SYSTEM**

The grantee shall establish, equip and operate a mass transit system supplementing the network operated by Régie Autonome de Transport de Casablanca (RATC), not replacing it.

One purpose of this concession is to provide means of transportation of good quality (seated capacity only).

#### **ARTICLE 6: RUNNING UNITS**

##### **A) OPERATIONAL FLEET**

In the apportioned service area, the grantee shall operate a number of buses so as to meet actual transportation demand in the above-mentioned routes in a satisfactory manner, in accordance with estimates on potential demand and number of buses to operate.

In any case, the size of the operational fleet shall be tailored to mass transit needs and new demand created by this newer system of transportation.

##### **B) SERVICE OPERATION**

Bus schedules and frequency shall be compatible with proper service delivery according to line and traffic special patterns so as to meet transportation demand during rush and off-rush hours. In any event, bus schedules and frequency shall be reviewed by the grantor for approval.

##### **C) TECHNICAL CHARACTERISTICS**

Vehicles:.

As all riders shall be seated, vehicle capacity shall not be under 25 seats. Charging extra fees and selling tickets to ride the bus standing shall be prohibited.

The inside of a vehicle shall be laid out in accordance with mass transit regulations and provide for easy and quick travel inside, on and off the bus.

- Inside walls and ceiling

Inside walls and ceilings shall be made of plywood, with vinyl lining.

- Floorings shall be made of plywood and covered with with a "TERAFLEX"-type carpet.

Riders seats shall be as comfortable as possible and aisle seats shall be equipped with an elbow-rest.

- Tinted windows must provide good visibility.

- The driver's cabin must provide good road visibility and the driver's seat must be adjustable and as comfortable as possible.

Vehicles shall be equipped with adequate lighting and air circulation systems at all times, whatever the season.

- Capability to adjust air circulation ducts located in the ceiling shall be provided.

Interior lighting shall be supplied by neon-type fluorescent tubes covered with plexiglass or any other opal material.

Exterior lighting shall meet current regulations.

The grantee may further improve the vehicle with sound equipment: radio, cassette player, microphone, speakers, etc.

#### D) FACILITIES TO BE SET UP

The grantee shall have access to adequate facilities to store, maintain, refuel and repair vehicles.

It is mandatory for the grantee to have towing capacity

Any vehicle removed from service for whatever reason shall be immediately replaced with a back-up unit. The specific size of the back-up fleet is to be set up by the grantee in charge of fleet maintenance in accordance with contract terms. In any case, the number of back-up buses shall not fall below 20% of the operational fleet.

More generally, the grantee shall purchase any additional equipment so as to maintain utmost cleanliness in operational vehicles and provide a pleasant and comfortable ride.

## B- ECONOMIC AND FINANCIAL PROVISIONS

### ARTICLE 7: CONTRACT TERM

The term of this contract shall be ten (10) years, to be extended by implied consent. It shall be reassessed in view of global savings achieved under the grant contract.

### ARTICLE 8: FARES

#### A) REGULAR FARES

Bids for grant rights shall be accompanied by a financial statement indicating the fare or fare(s) to be charged for a given service area.

Fares as well as any subsequent adjustments shall be approved by the public agency.

#### B) FARES FOR SPECIAL SERVICES

The grantee may offer special transportation services such as vehicle leasing for short, long or specific periods of time provided that the quality of regular service is not jeopardized.

The grantee may also offer group fares for students or special categories of riders or travels in so far as such fares are reviewed by the grantor for approval.

#### C) ADVERTISEMENTS

Commercial advertisements may be posted outside, inside buses, offices, facilities, etc.

#### D) FARE INCREASES

Bus fares applicable to the service area are set inclusive of all taxes. These fares may be increased each year to reflect changes in operational costs in the related service area.

To this end, the following rate increase formula shall be applied:

$$t = 0,20 + (0,22 \quad ) + (0,03 \quad ) + (0,46 \quad ) + (0,09 \quad )$$

$t_0$  = Initial fare as specified in this contract

$t$  = revised fare

$C_0$  = Diesel price when initial fare ( $t_0$ ) goes into effect

$G$  = Diesel price when proposed fare increase is being reviewed

$P_0$  = Unit price of one tire (1100x20) when initial fare ( $t_0$ ) goes into effect

$P$  = Unit price of one tire (1100x20) when proposed fare increase is being reviewed

$SO$  = SMIG (guaranteed minimum wage) level when initial fare ( $t_0$ ) goes into effect

S = SMIG (current minimum wage) level when proposed fare increase is being reviewed

PRO = Price of eighteen (18) commonly used spare parts in mass transit (See Appendix A) when initial fare (to) goes into effect

Adjustment ratio versus initial fare as specified in this contract.

PR = Price of eighteen (18) commonly used spare parts in mass transit when proposed fare increase is being reviewed.

Fare increases requests shall only be considered when equal to at least 5% of the exact fare in effect at the time the request is under review.

The higher fare shall be rounded up to the next tenth of one dirham and the grantee shall pay back any amount above the exact fare to the public agency. Fare increases shall become effective only when the relevant public agency has given its approval by way of official correspondence specifying the exact new fare and user charges.

#### **ARTICLE 9: FEES**

The grantee shall propose and pay a yearly flat fee per operated bus line. The amount of this fee and adjustment review procedures shall be specified in the grant contract and the fee shall be inclusive of all taxes. Fee increases shall be subject to the same provisions as fare increases.

#### **ARTICLE 10: SECURITY DEPOSIT**

The grantee shall pay a security deposit in the amount of ten thousands dirhams per operated bus line to ensure proper implementation of contract terms which may be verified at any time by relevant agency departments.

#### **ARTICLE 11: FINES**

Any violation of this grant contract shall be recorded in an official report and sanctioned by a fine equal to ten times the amount of total round-trip fares on one bus line, notwithstanding vehicle impoundment.

Fine payments related to violations of grant contract shall be allocated to the budget of the Casablanca Urban Community.

### **C- ADDITIONAL PROVISIONS**

#### **ARTICLE 12: PERIOD OF VALIDITY FOR BIDS**

Bids shall be valid for at least 90 days after the last filing date specified in the request for proposals.

#### **ARTICLE 13: INFORMATION PROVIDED BY THE AGENCY**

The bidder may obtain from the Wilaya departments the following documents and information:

- A map of the current RATC service area
- A chart indicating line groupings to be serviced, the number of lines and routes.
- Any statistics pertaining to bus transportation and available in the Wilaya as a result of studies carried out by RATC and various national and foreign consulting firms.

#### **ARTICLE 14: EFFECTIVE DATE OF CONTRACT**

This grant contract shall only be valid and final upon approval by the Ministry of Internal Affairs and notification of such approval by the Wali of the Greater Casablanca area.

#### **ARTICLE 15: IMPLEMENTATION DATE**

All contract provisions shall become binding seven months at the latest once the grantee receives notification to be certified by a statement originating from the Wali.

#### **ARTICLE 16: DISPUTES**

Casablanca tribunals are the only courts with jurisdiction over disputes between contracting parties.

#### **D- DUTIES OF THE GRANTEE**

##### **ARTICLE 17: EQUIPMENT MAINTENANCE**

Subject to the terms of this contract and the statement of work, the operator is granted full authority to manage the granted service as appropriate.

The grantee shall provide good maintenance and replace operational vehicles as needed.

The public agency reserves the right to verify that equipment remains in working order. In case of inadequate maintenance, the Agency may compel the grantee to remedy the situation within a specified timeframe. In case of non-compliance, the grantee shall bear the costs of vehicle overhaul.

##### **ARTICLE 18: CONTINUITY OF SERVICE**

Excluding acts of God, the grantee shall maintain continuity of service in accordance with provisions as specified in this statement of work and in the grant contract whatever the circumstances or bear all costs incurred by the public agency to provide said services on a temporary basis.

However, the grantee is entitled to seek full recovery of expenses in case public agency measures further deepen grantee's predicament.

By contrast, should the operator jeopardize public safety due to inadequate facilities or faulty equipment, the public agency shall immediately take all necessary steps to prevent hazardous situations, all costs and risks being borne by the grantee.

**ARTICLE 19:**

The grantee shall bear all corporate operational costs. The grantee shall solely and at his own risk ensure the financial viability of his concession.

The grantee may invoke no special status to claim relief from current tax laws.

Furthermore and unless otherwise provided by law, the grantee shall pay any and all damages that may be due to third parties as a result or when implementing granted services or maintenance of related facilities.

**ARTICLE 20: SERVICE AREA**

The grantee shall set up a bus service including one or several lines to be broken down as follows:

The grantee shall not use routes assigned or planned to be assigned to RATC.

This provision applies to the current and future RATC service routes.

Exemptions may be granted by the public agency upon review by the traffic committee.

The grantee shall set up bus stops separate from RATC's in order not to impede operation of future and current permanent facilities and RATC fleet, in accordance with plans and in locations approved by the public agency.

Furthermore, the grantee shall provide adequate equipment maintenance and servicing, information and sign fixtures which must be different from RATC's and approved by the public agency.

**DISCUSSION FOLLOWING THE PRESENTATIONS BY  
TAHIRI AND HIROUF WITH COMMENTS BY MR. BENNANI**

Question for Dr. Tahiri:

Based on your experience in the area of private transportation, what are the key elements one should consider for the privatization of waste collection and treatment and to ensure cost effectiveness?

Answer:

This somehow goes back to the issue I addressed at the beginning, that the specifications must be extremely flexible. In the course of our experience, we see more and more operation problems, management problems because managing a service is extremely difficult and much harder than managing a small 100% privately-owned business; in addition, there has to be a reciprocity between the municipality who will grant this public utility (because it still remains a public utility) and the private sector.

So, here is how I could answer your question: the specifications must be totally representative.

As for picking up refuse, I think that the company must be encouraged in the matter of land for the purpose of handling its materials. The investment code gives us certain advantages compared to companies said to be purely private, i.e. companies which have far greater profit margins. Why not think of tax exemptions, as I said several times, but also of a more advantageous bank rate for enterprises which can be privatized.

At present, we have problems with the bank in relation to the management of our current business, such as a favorable rate granted for corporate accommodations (at the present time, these rates are between 6% and 9%); then, why not consider such actions as complementary actions toward a working public utility which already knows the problems, or act in such a way as to have certain state financial institutions (DGCL, CIH, ...) in order to try to give certain advantages to the sectors which are akin to the business sector, like transportation, waste, housing, etc.

Certain problems occur as the company of which we have no prior knowledge is operating; Mr. HIROUF spoke earlier of thoroughly studied, well-packaged specifications we signed, with which we acquainted ourselves and for which we are responsible. This is true; however, there are things which appear along with the changes occurring in the company, in the world, and from one day to the next which cause havoc with the rational operation

of the company. The speaker must be both totally open to the private sector's proposals and connected to a social service. It is essential to have some expertise regarding labor law -- for instance, we have many problems at the present time in the area of labor law -- and consequently we must listen to private companies in order to help them succeed in a mission which is difficult because it concerns the community. This mission is not about a secondary need, it is about a primary one.

What can be retained from this privatization experience of urban public transportation is that there exists a complementarity between the action taken by the municipality -- therefore that taken by the directly managed public utility -- and the action by the private sector to whom part of this public utility is granted. Of course, this complementarity provides a certain kind of emulation to the public utility. This is why many presenters have mentioned the fact that, in order to improve the service and promote competitiveness, it may be necessary not to go directly to a total privatization of the household waste collection and treatment public utility by a municipality but to a partial concession, that is a partial privatization which would then be a test model and make it possible to create a competitive spirit in the city's own services.

There should be competition and in fact, this competition cannot occur unless there are equal bases.

What we should also keep in mind is that at the start of this experiment, there were no urban public transportation professionals; there were transporters. Certainly, when we speak of privatizing the waste sector, there will not be waste professionals but builders of heavy vehicles or trucks equipped with bins, or tools necessary to perform the service, that is professionals, downstream, for the revaluation of certain products, but there would not be any professionals of service management. This is true, if at the beginning the utility is designed to be granted to companies already set up in other countries and experienced, which have already worked in a number of municipalities. By adapting to the Moroccan situation, it would be possible at a later date to create professionals and thus bring in a body of professionals who would gradually be asked to be more effective and to perform the service more efficiently. We can also point out a very important factor -- it is not possible to come and implement privatization without studying and solving all the problems of the environment around the sector.

At first, we should perhaps control what the private sector will do and this should be well-defined in the specifications, but more and more, we should let competition make the choices and give a certain freedom in the framework of an objective which must be very precise from the start.

## **CLOSING REMARKS**

**presented by**

**Mr. Ahmed Chouqui Bennani, Director of Local Government,  
Ministry of the Interior**

During this seminar, we heard numerous presenters from all horizons, experts as well as professionals, men from the Government, executives from among the elected officials in the Local Government, Moroccan and American officials, as well as French and Spanish experts. This means that the organizers sought to multiply the presenters in order to have an idea of all the experiences and I believe that we can all congratulate ourselves for our work in which USAID along with Directorate General of Local Government (D.G.C.L.) and ICMA actively participated.

I wish to thank in your name, in the name of USAID, and in the name of the Directorate General Local Government all the people who participated from near or far to the organization of this demonstration which in itself was a success.

The objective of this seminar was to bring us into contact with the topic for the first time, to identify in what directions everyone is going, and to think about and bring its contribution into our work (at the local level) from now on. This is why I am inviting all the participants in this enterprise, if they wish, to contact D.G.C.L. or I.C.M.A. who was one of the organizers, or USAID, and convey all the ideas or suggestions they were not able to express or develop in the course of this seminar, for we plan to try to implement a pilot operation. We are looking for the necessary financing and we would like afterwards to have another meeting such as this one in which we will try to go further in our thinking.

The seminar is continuing, in spite of the conclusions we will make and we are ready to put more thought in the topic.

I will try to synthesize the dominant ideas of our seminar at the risk of forgetting many things and I apologize in advance. We can then retain from this seminar that:

- The topic was a good one, its choice with USAID was in line with today's concerns at both the local and central levels. The past few days confirmed this.
- The possibility to have recourse to the private sector in order to improve the urban waste service while reining in the costs must be open to the Local Communities, if we wish to overcome the present difficulties.

- Certain presentations called privatization a train which has departed all over the world and which it is necessary to catch. This is true for all the services which were privatized in Morocco thanks to the policy we have engaged in for two or three years.
- Mr. Perreaut said it is not a panacea, but it is a good solution when the necessary conditions are gathered.
- According to the Director of USAID, there are two major conditions for the community. The private sector must bring in at least as much as, if not more than, it originally did. As for the company, it seeks to make its operation profitable. Therefore, we cannot demand that the private sector provide welfare. Given the fact that this sector presents an area unknown to the contractors, the Local Communities must ease the apprehension caused by the problems linked to urban waste and supply all possible kinds of assistance to attract the private sector and make it feel secure so that it can innovate, intervene efficiently, and make its business profitable.

Wishing to privatize does not signify a disengagement from the community or a lesser involvement in the service by the community. On the contrary, it is necessary for the community to always have a competent organization available to set up the operation, and then to follow and supervise the private sector in its action. It also is necessary to negotiate carefully at the onset so that the bases for work are known in advance.

The operation must be profitable for the private sector. Therefore, the investment it will make must be carefully studied and optimized; the duration of the concession must be in compliance so that it can be made profitable and thus improve as well as develop the service entrusted to it.

In this brief conclusion, I am trying to repeat what was said before -- though not as well as the presenters themselves did-- by appealing to you for what might have been forgotten.

- It was also said that privatization must not be viewed as an all or nothing operation and it must be done in controllable stages.
- It is prudent to privatize by segments with one or two companies, from, as it were, a section of the chain which represents a problem to the community or a geographical sector. Often, one starts with the industrial sector, or a commercial sector, or an already well-known downtown area.

This prudent, pragmatic step must not represent an obstacle to the community's retaining an overall picture of what it is doing to reach an integrated management of the complete cycle of solid waste.

In particular, in large megalopolises such as Casablanca and Rabat, it is difficult to envision several managements which would be different; there must be a satisfactory framework for everyone.

Without going out into the polemic of what must be the responsibility of the community and what must remain at the level of the municipalities, it is necessary to reach a totally integrated management which allows the profitability of the investments.

If a megalopolis such as Casablanca had to have as many transfer centers and collection materials maintenance plants as municipalities, you can easily imagine the cost prices.

It is necessary to reach balanced integrated solutions which especially do not ignore the user who must participate. The user can say many things, as was evidenced in this seminar; we must listen to him and include him.

Of course, we must start testing privatization in well-known neighborhoods which are not neighborhoods experiencing problems, or in a segment which it is necessary to learn to control and make profitable such as the transfer centers we discussed. Managing these facilities after they have been built is complex; in addition, the tests we conducted in Fès were not conclusive.

The choice of procedures adapted to the nature of our waste and the necessity to have a final sanitary landfill in all cases was also discussed.

The market studies to be done before opening a composting station which can be useful in producing fertilizer while lowering the disposal costs was mentioned.

Other possible kinds of recycling whenever it is appropriate was discussed as well. But we must not ignore the importance of the informal sector which already works there at all stages, from the collection to the landfill. It is a social area which derives a living from it and which cannot easily be eliminated by the adoption of radical solutions.

In conclusion, we cannot forget the environmental aspect as well -- the primary concern -- or limit ourselves to picking up trash only most of the time and then drop it in the next rural municipality, thus getting rid of the problem.

Protection of the environment, most particularly of the groundwater tables precious to Morocco, demands community solidarity between the municipalities involved.

From these ideas assembled throughout the past few days, emerges an important conclusion for our topic: the necessity to carefully define the rules of the game from the start.

To simply say that privatization is the ideal solution for solving the waste problems would lead us to bitter failures.

It is necessary to have rules of the game which are clear at all levels: national, regional, and local as well as: institutional, technical and normative levels, including financing and pricing, and finally, at the global environmental level, measures to encourage state and local government action.

A writing committee has been set up to excerpt the main recommendations of this seminar.

Mr. Perreault will present them to you and you may then complete them.

Our seminar will not conclude today; it is only beginning.

We will have other meetings to delve more deeply into the subject. We hope to do so with researchers, university people, national and foreign professional associations, such as I.C.M.A.

I thank you for your participation and your interest in the subject. Thank you.

## RECOMMENDATIONS

The participants were unanimous in concluding that the possibility of seeking out the private sector in order to improve the quality of service, rein in the costs, and lighten the management costs of the municipality constitutes a very necessary solution when all the pertinent conditions at the ecological, technical, institutional, and pricing levels are gathered.

It was recommended that at the national level, legislation be adopted to set technical norms more fully in connection with sanitary disposal, collection and treatment with a goal to preserve the quality of the air, water resources, and public health. In addition, means of control for the application of the legislation should be implemented.

It is recommended that the municipalities, before any privatization, draw up solid waste disposal guidelines which would particularly include a diagnosis of the situation, a medium- and long-term plan of action, feasibility studies, studies on the impact on the environment and a cost-price study.

To implement these recommendations, a general framework in real terms should be established at the central level to direct the operators responsible for these guidelines. In addition, a training plan for municipal managers must be implemented in collaboration with the pertinent professionals and professional associations at the national and international levels.

## INSTITUTIONAL PLAN

Household waste collection should be individualized in the municipal structure in order to ensure that its management will take place in an autonomous manner, either directly by municipal services, or by public or private entities. This implies the marshalling of sufficient resources to address investment and operating expenditures.

Autonomy in selecting the means of intervention, maintenance, and reconditioning of the fleet. Responsibility for the direct management of the staff affected to this service.

In all cases, it is necessary that operation specifications be established on the basis of the conclusions of the guidelines and this should be followed, whatever the management method may be.

## **PRICING AND COST DESIGN**

The participants are convinced that an improvement in the quality of the services could be accompanied by a revision of the cost recovery methods through the implementation of fees for services rendered, provided they be narrowly associated with the service's reorganization, more particularly when appealing to the private sector.

## **EDUCATION OF THE PUBLIC**

The participants are aware that without a plan to sensitize and reeducate the users, no master plan could be successful given the necessity for the population to be in complete agreement with any reform connected to the service.

## **SUB-RECOMMENDATION**

These main recommendations will be supported by sub-recommendations where incentives, value-added, rights at the level of imported products (imported trucks, packing bins) will be addressed.

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