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**Institutional, Economic, and Human Resource Issues
Associated with Solid Waste Services in Latin America**

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ABSTRACT

The management of municipal solid wastes (MSW) in Latin America is, and traditionally has been, a primary responsibility of local governments. In a large percentage of medium-size municipalities in the region, the management of MSW may use between 30% and 50% of the total municipal budget. The management of solid wastes is a complicated process that not only requires the proper selection and application of approaches for the storage, collection, transport, transfer, processing, and final disposal of the material, but also depends upon the close cooperation between the users, the private sector, and governmental and non-governmental organizations.

Most proposed solutions for the management of municipal solid waste generated in developing countries, and in Latin America in particular, concentrate on technical matters and ignore non-technical considerations. Some of the more important non-technical issues that must be addressed in the privatization of services are: development of a sound, achievable, and reliable national policy; preparation and implementation of adequate institutional arrangements; issuance and enforcement of appropriate and modern regulations; availability of trained and motivated personnel; optimal financial control and supervision of the services; and adequate allocation of timely distribution of funds.

At the present time, the environmental problems faced by most countries in Latin America are very similar and are related to their demographic situation and economic growth. Currently, the solid waste management system in Latin America is extremely deficient and has a substantial economic deficit. To overcome some of these problems, there is currently a trend toward strengthening the institutional situation and toward the privatization of solid waste management services. Private firms are taking on the responsibility for pollution control and have been given the authority to implement pollution control programs.

INTRODUCTION

Some of the major threats to public health and environmental quality in many economically developing countries include contaminated water supplies, as well as uncontrolled and improperly managed urban wastes, and human and animal excreta. Substantial environmental degradation is especially evident and problematic in the large metropolitan areas of those countries.

At the present time, nearly 20% of the entire population in the Latin American region lives in seven large metropolitan areas: Mexico City, Mexico; Buenos Aires, Argentina; Santiago, Chile; São Paulo and Rio de Janeiro, Brazil; Caracas, Venezuela; and Bogota, Colombia. In addition, about 40 cities in the region have a population of more than 1 million. In 1980, the urban population in Latin America was on the order of 58% of the total population. The urban population is expected to reach nearly 77% by the year 2000. The fastest population growth is taking place in cities with populations over 5 million inhabitants.

These statistics indicate that nations in Latin America tend to have a relatively high population growth rate. The high population growth rate is due to several factors, such as religious, cultural, educational, and socio-economic conditions. The annual population growth rate in Latin America and the Caribbean varies from negative 1.4% in the Virgin Islands to 3.1% in Honduras, while the average growth rate for the entire region was about 1.4% per year for the period between 1985 and 1992. Furthermore, the urban population in the region is increasing at an even greater rate because, due to a number of reasons, there is a massive migration from rural to urban areas. For example, the metropolitan area in Lima, Peru absorbs approximately 150,000 people each year, mostly from Peru's most economically depressed areas.

On a global scale, the combination of very high population growth with the high influx of people from the rural into the urban areas is resulting in the establishment of very large cities. It is projected that by the year 2000, there will be 21 "megacities" having populations of 10 million or more. In addition, the projections indicate that of the 21 megacities, 18 will be in developing countries. Population data for the larger metropolitan areas in the world are presented in Table 1. The data in the table show that 4 of the 13 metropolitan areas are situated in Latin America (São Paulo, Rio de Janeiro, Mexico City, and Buenos Aires). Two of the metropolitan areas are in the top 4 most populated ones (São Paulo and Mexico City). Just like cities in other regions of the world, large Latin American cities have the tendency to be densely populated.

Table 1. Population (in millions) of Large Metropolitan Areas Around the World

City	Year	
	1992	1993
Tokyo, Japan	25.8	28.0
São Paulo, Brazil	19.2	22.6
New York, New York	16.2	16.6
Mexico City, Mexico	15.3	16.2
Shanghai, PRC	14.1	17.4
Bombay, India	13.3	18.1
Los Angeles, California	11.9	13.2
Buenos Aires, Argentina	11.8	12.8
Seoul, South Korea	11.6	13.0
Beijing, PRC	11.4	14.4
Rio de Janeiro, Brazil	11.3	12.2
Calcutta, India	11.1	12.7
Jakarta, Indonesia	10.0	13.4

The environmental problems currently faced by the majority of countries in Latin America are very similar and are related to their demographics and economic growth.

The protection of the environment and public health in Latin American countries does not necessarily accompany

the region's industrialization process. Moreover, environmental regulations, if existent, are either rarely enforced or enforced with great difficulty.

DEVELOPMENT OF A NATIONAL POLICY

Municipalities in Latin America cannot develop and implement reliable, efficient, and cost-effective solid waste management programs without clear national goals and priorities. In the development of goals and priorities, consideration should be given to some of the usual basic requirements in solid waste management, such as the provision of waste collection services to the entire population (including the urban poor), the application of waste reduction and waste minimization measures, the implementation of recycling programs, and the improvement of final disposal procedures.

The national policy should be developed through the establishment of a national committee composed of representatives from both the public and private sectors and in close consultation with the public. It has been demonstrated that no government policy or strategy will be successful without the full acceptance and cooperation of the public (the end users of a solid waste management system). In order to be politically sustainable, the development of a national policy should be based on realistic goals, taking into consideration the social, political, cultural, and economic conditions and limitations of the country. For instance, in some cases, the public may be required to choose between providing collection services to the entire population and establishing a sophisticated recycling program.

Furthermore, the national policy should clearly define the roles and responsibilities of the various government entities and other pertinent organizations in order to avoid overlaps, inefficiency, and controversy. A clear message should be included on the roles, responsibilities, and rights of the users of the system.

Finally, the national policy should direct the responsible entities to elaborate and enforce an appropriate regulatory and legal framework which would allow those responsible for the implementation of the policy to achieve and maintain the goals.

INSTITUTIONAL ISSUES

Some of the most important institutional issues associated with the management of municipal solid wastes that have been observed in most Latin American countries include the following: arrangements for the management of the waste, organizational procedures, and the structure and capabilities of the institutions responsible for planning and conducting the work.

Institutional Arrangements and Integration of the Sector

One of the most important steps toward improvement of the solid waste management system in most developing countries deals with major modifications to organizational structures and improvements in the area of human resources of the local governments. In Latin America, the organizations associated with solid waste management are poorly organized and lack the hierarchy and importance that other public services (such as water supply and public works) are given. In most situations, local governments are accustomed to receiving assistance from the central government and do not take the time to improve their MSW management capacity. Consequently, local governments may require assistance in the establishment of a specific department or authority to deal with solid waste management issues. The degree of autonomy between local government and central government may depend upon the size and degree of development of the particular city. Neighboring, small municipalities may decide to jointly establish a regional organization to deal with their solid waste management tasks.

As the various departments or agencies are established, it will be necessary to systematically review and clarify the

various roles played by other entities involved in municipal services, such as drainage, sewerage, and roads, in order to avoid overlaps and to promote efficiency.

Decentralization

In most cases, local governments are responsible for the collection and disposal of the wastes generated within their jurisdiction, as well as for the operation and maintenance of their equipment. However, generally, the local governments lack the authority and resources to provide a satisfactory and economically viable service. Effective and efficient solid waste management is highly dependent upon an equitable distribution of responsibilities, authority, and revenue between national government and all local governments.

Consequently, decentralization of the authority in solid waste management should be accompanied with a similar apportionment of administrative and financial control, as well as the capacity to plan, implement, and operate all of the systems necessary to provide a satisfactory service. This process should include a definite improvement in the procedures for the preparation of budgets. Budgets should be prepared based on actual costs and looking toward obtaining the necessary level of funds to provide the service. Decentralization is an excellent approach to dealing with solid waste management issues; however, if not properly planned and implemented, it will not work and will simply lead to additional bureaucracy.

Planning and Management Methods and Procedures

The majority of countries in the region do not have any type of planning or management methods applied to solid waste management. Countries that have planning methods do not apply them in a practical and efficient manner. In order to reach acceptable levels of solid waste management service, as well as to increase the efficiency of the system, local governments must give special attention to financial and strategic planning methods. Financial planning should include budget planning, cost accounting, and financial analysis. Furthermore, system efficiency can be substantially improved by implementing a management information system (MIS), conducting waste characterization programs, establishing procurement procedures, and developing simple and cost-effective methods to monitor system performance.

Capacities of Local Waste Management Institutions

The majority of municipalities in Latin America have serious deficiencies in their capacity to provide efficient and acceptable solid waste management services. Most of the staff assigned to deal with solid waste matters are not adequately trained and lack the most basic preparation to deal with the problem. In fact, in many cases, some officials are requested to deal with solid waste more as a penalty than as a result of their interest in this field. Another serious difficulty faced by solid waste management organizations in developing countries is the impact had on them by changes in government. Generally, a change in local government results in complete changes in personnel and the rejection of policies and systems implemented by previous governments.

Therefore, high-ranking officials in local government must understand the importance of solid waste management and its relationship to the protection of public health and the environment. Once that is accomplished, a well-conceived and highly-effective training program should be developed and implemented. The training program must be very specific and must require the participation of only staff with sufficient preparation to participate in such program.

The establishment of a professional association for solid waste management can play a critical role in the improvement of the sector.

Private (Formal and Informal) Sector Participation

Private enterprises can provide efficient and cost-effective collection, transfer, processing, and final disposal of solid waste in most of the countries in the region. However, the participation of the private sector must take place within

a certain framework; otherwise, the benefits of its participation may not be realized. This framework includes: 1) availability of adequate supervisory capacity in the local governmental institutions, 2) competitive and transparent bidding process, 3) availability of private companies having the technical and financial resources to provide the desired services, 4) availability of appropriate regulations, and 5) the existence of a clear and well-prepared contract between the local government and private entities.

In general, a local government should carefully analyze the options and decide whether or not privatization of all or part of the solid waste management system should take place. Privatization should result in an improved service at a similar or lower cost than that achieved through a municipal service. It is important that specific solutions be determined for each community; copying or adopting solutions specifically developed for industrialized countries generally will not be neither successful nor sustainable.

Community Participation

It has been demonstrated on many occasions that no system for the management of solid waste will be successful without the acceptance of the system by the majority of the community. It is, therefore, imperative that municipal authorities and solid waste managers seek and obtain the participation of the community during all stages of the planning process. Feedback from community leaders, and eventually from as many members of the community as feasible, should be obtained before a system for the management of solid wastes is defined and implemented. This is particularly important in locations where low-cost, labor-intensive solutions are sought and in which a high level of user participation may be required.

The support of non-governmental organizations, particularly those knowledgeable of the socio-political conditions of the area, may be instrumental in securing community participation.

REGULATORY MATTERS

First and foremost, improvements in the provision of the solid waste management service is a function of the existing systems of administration and urban planning. Generally, it is necessary to prepare a realistic comprehensive plan. The plan can have several names: master plan, strategic plan, and others. Regardless of the name given to the plan, it should include accurate information on the type, quantity, and quality of the waste. In addition, the plan should set goals in terms of collection coverage, degree of waste reduction, levels of recycling, etc. The plan can be implemented only within a certain legal and regulatory framework. This framework should be comprised of a set of ordinances, laws, and regulations concerning the management of solid wastes. The laws should include appropriate responsibilities for enforcement and inspection.

Currently, most countries have extremely basic and ineffective laws associated with solid waste management. In general, the laws simply indicate the responsible agency and that this agency must collect and dispose of the waste. Thus, existing laws and regulations must be modernized in a practical manner. The modernization process should be carefully carried out so that changes lead to improvements in the current conditions but do not necessarily result in a financial burden to the community. The modernization process of the legal and regulatory framework should also avoid, at all costs, copying of regulations from industrialized countries. This is a practice that has been conducted in a few instances and that has led to costly investments and goals that are extremely difficult to achieve.

HUMAN RESOURCE ASPECTS

In most countries in the region there are no well-established and reliable information systems dealing with solid waste management. Consequently, it is difficult to know with any degree of accuracy the actual number and qualifications of the personnel working in solid waste management. However, based on the author's experience, it can be estimated that the average number of workers in the solid waste sector in large cities is between 0.5 and

0.9 per 1,000 inhabitants. It is possible that the average number of workers is lower than this range in medium and small cities. This number does not include a relatively large number of people who conduct recycling activities (both formally and informally).

With only a few exceptions, primarily in the large cities, most of the personnel who participate in the solid waste sector have received minimum or no training. This is true for both the professional and technical levels. In addition, the average age of the laborers is very high. Typically, laborers in the solid waste field are not provided with adequate equipment to perform their duties, very few of them are given safety protection equipment, and most of them are not motivated to perform their tasks efficiently.

SUMMARY AND CONCLUSIONS

In most countries in Latin America, the management of municipal solid waste has traditionally been a primary responsibility of local governments. In a large number of medium-size municipalities, the management of MSW can use between 30% and 50% of the total municipal budget. The majority of urban centers in the region are not properly managing their municipal solid wastes. A substantial percentage of the wastes remains uncollected. The wastes that are collected generally are disposed in open dumps.

There are a number of issues that should be addressed to appropriately deal with the solid wastes generated in Latin America. Isolated investments in equipment and technology do not address the key issues, and generally the investments are wasted. For investments in equipment and in technology to be successful and sustainable, they must be preceded by investments in the following areas: development of a sound, reliable, and achievable national policy; preparation and implementation of adequate institutional arrangements; issuance and enforcement of appropriate and modern regulations; and motivation and training of human resources.