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Strategies For Improving Urban Solid Waste Management: Lessons from Three Decades of World Bank Lending

Carl R. BARTONE

Lead Environmental Engineer (Retired), The World Bank, Washington, DC, USA

Abstract - While solid waste is arguably the most decentralized service worldwide, few municipalities in low- and middle-income countries are doing a good job of service delivery. Based on experiences from over three decades of World Bank lending, as well as the Bank's participation in the Collaborative Working Group (CWG) for Waste Management, this paper discusses key issues and problems associated with municipal solid waste management, and recommends strategies for addressing the issues. To improve future projects, more attention should be given to strategic service planning, better institutional arrangements, more efficient operational management, more effective financial management, and improved environmental protection. Specific recommendations are provided for each of these priority issues. Finally, a proven approach to strategic planning for solid waste services is presented.

I. Introduction

Urban solid waste management (SWM) is an integral but much neglected part of the broad urban environmental management of cities. Despite consuming a major share of municipal budgets – often between 10 to 50 percent of operational expenditures – solid waste services in the cities of most low- and middle-income countries are unreliable, provide inadequate coverage, interfere with other urban services, and have adverse impacts on public health and the urban environment. It is the urban poor whose health and well being is particularly affected by these service failures. Finding and implementing cost-effective and affordable solutions requires a more strategic focus.

While SWM is a municipal responsibility in most countries, it has often been neglected. The process of decentralization in many countries over the last decade has raised the consciousness of municipal administrators about the importance of this sector – both because the voting public is now demanding improved urban services, and because the provision of this service represents a major expenditure item for local governments. At the same time, there is increasing pressure on municipalities from state environmental agencies to properly dispose of the solid waste that is collected, often in the form of an “unfunded mandate.” There are, however, a number of issues to be addressed if substantial improvements are to be achieved. An analysis of projects supported by the World Bank and other international experience with SWM can help in the identification of these issues and suggestions for addressing them.

II. World Bank Support for Urban Waste Management

During the past three decades, the World Bank Group has provided financial and technical assistance for 219 urban solid waste projects totaling US\$2.8 billion. Financial support is provided mainly by the International Bank for Reconstruction and Development (IBRD), the International Development Association (IDA), the International Finance Corporation (IFC), the Global Environment Facility (GEF), and the Prototype Carbon Fund (PCF). The World Bank Institute (WBI) also has an urban SWM training program. In 1995, the World Bank created a Thematic Group on Urban Waste Management to help guide Bank-wide activities in this important sector, which is still active today.

Three major reviews of World Bank lending for solid waste management [1, 2, 3] provide the data and the historical perspective for the policy analysis presented in this paper, and give guidance for recent initiatives to improve the effectiveness of Bank support in this sector.

The first dedicated solid waste management project supported by the World Bank was for Singapore in 1973, and lending has steadily risen since then. Currently, there are 85 projects under supervision with a value of US\$1.2 billion, and some 40 future projects are included in the Bank's lending pipeline. The distribution of projects and funds by period is shown in Table 1.

Table 1
World Bank Lending for Urban SWM

Period	Number of Projects	Value of Projects (US\$ billion)
1973 - 1986	63	0.532
1987 - 1996	71	1.043
1997 - present	85	1.207
Total Loans	219	2.782
Future 5-year Lending Pipeline	40	t.b.d.

(Source: World Bank data).

Of the 85 current projects, only a few are dedicated solid waste management projects. Many of them are components of broader municipal development or modernization projects. Others are components of urban environmental management projects, water supply, sanitation and pollution control projects, environmental institution building projects, low-income area development projects, or emergency reconstruction projects. The projects deal with the following aspects of waste management: disposal (53), collection (47), industrial/hazardous waste (20), and hospital waste (10).

In addition to project financing, the Bank also seeks to forge partnerships to address urban solid waste problems with client cities, waste management specialists and other international donor institutions. The Collaborative Working Group for Waste Management (CWG) is such a partnership that has been created through the initiative of the Swiss Agency for Development and Cooperation (SDC), the Urban Management Programme (UMP), and the World Bank. The CWG also involves other multi- and bilateral partners, and a network of developing country experts, professional associations, and specialized non-governmental organizations (NGOs) such as the Swiss Centre for Development Cooperation in Technology and Management (SKAT) and Waste International.

The CWG was launched at a workshop in Ittingen, Switzerland in April 1995 [4], during which a multi-year joint work program was agreed, and a conceptual framework approved [5]. Subsequent CWG workshops focused on the topics of private sector participation for solid waste service delivery (Washington, DC, 1996); micro-enterprise involvement in solid waste service delivery (Cairo, 1996); ultimate disposal options including sanitary landfill, recycling, composting and hospital wastes (Belo Horizonte, 1998); and a workshop on strategic planning approaches for sustainable and integrated solid waste management (Manila, 2000). The most recent workshop, held in Dar es Salaam in March 2003, was on the topic of solid waste collection that benefits the urban poor.

The joint work program of the CWG has produced a unique body of publications and tools (knowledge base) produced by various of the partners, including the Bank's Thematic Group, covering the following topics:

- conceptual framework for municipal solid waste management [5];
- manual for micro-enterprise development in solid waste management [6, 7];

- decision-maker's guide and technical paper on sanitary landfill [8, 9];
- decision-maker's guide and technical paper on incineration with energy recovery [10, 11];
- guide for national solid waste sector studies [12];
- strategic planning guide for municipal solid waste management in large cities [13];
- toolkit for solid waste planning in medium and small cities [14, 15];
- toolkit for social assessment and public participation in municipal solid waste management [16];
- handbook, guidance note and case studies on health care waste management [17 - 19];
- series of technical notes on ultimate disposal and treatment options [20 - 27];
- toolkit for preparing bidding documents and contracts for private sector participation in solid waste service delivery [28]; and
- directory of MSWM publications and organizations [29].

Based on the lessons learned through World Bank supported solid waste projects, CWG activities and an extensive interaction with clients and donor partners, a number of key issues and problems associated with municipal solid waste management in low- and middle-income countries have been identified, and strategies suggested for addressing the issues. Both the issues and the strategies are summarized in the following sections. It is encouraging that most of the proposed solid waste projects in the Bank's lending pipeline are being designed to take account of these issues and provide integrated waste management solutions.

III. Issues in Urban Waste Management

Urban solid waste management is often the most costly and vexing problem for local authorities. There is low service coverage, especially in low-income neighborhoods. On the management side there are substantial inefficiencies at the same time that there are insufficient resources. And in too many places there is still widespread open dumping. The result is a high cost to society in terms of public health impacts and environmental degradation. The following issues need to be addressed if real improvements are to be achieved:

- the extension of service coverage, especially into poor neighborhoods, based on the concepts of demand management, affordability and participation;
- the closure or rehabilitation of existing open dumps while at the same time protecting the livelihood and health of waste pickers and their families;
- the introduction of sanitary landfills as the backbone of disposal operations, often in the face of strong social opposition (the Not in My Back Yard or NIMBY syndrome);
- the integration of complementary systems such as transfer, selective collection, recycling, composting and/or waste-to-energy, where it makes economic sense, together with public education campaigns and incentives for waste reduction at source;
- the definition of better healthcare waste management systems;
- the introduction of adequate user charges and collection mechanisms so as to achieve self-financing, along with needed cost accounting and management information systems;
- the promotion of private sector participation, including micro- and small-scale enterprises, as a response to often weak municipal operational capacity; and
- the development of cooperative mechanisms that would enable municipalities to undertake shared disposal solutions, especially in metropolitan areas.

IV. Issues in Urban Waste Management

To better address this set of issues, progress on five fronts is needed simultaneously. First, an integrated, comprehensive strategic planning framework should be adopted at the national and local levels, especially for large metropolitan areas. Second, better institutional arrangements are needed in the sector. Third, there is a need for more efficient operational management. Fourth is the need for more effective financial management. Fifth, attention should be given to improving environmental protection. Each of these five strategies is discussed in greater detail below.

A. Strategic service planning

A more comprehensive policy framework is needed at the national and provincial level. It should link public health, environmental and decentralization policies more closely together so that they are mutually supportive. It should also provide incentives to municipal authorities to deliver better services, recover more costs from users, and cooperate with neighboring municipalities. It is important to note that this is not just a need for low- and middle-income countries – the EU directives for solid waste require member countries to formulate a national solid waste management strategy.

Large municipalities and metropolitan regions should be encouraged to undertake city-wide strategic planning to design and implement integrated solid waste systems that are responsive to dynamic demographic and industrial growth. Strategic planning starts with the formulation of long-term goals. The strategy and action plan should identify a clear set of integrated actions, responsible parties and needed human, physical and financial resources. The city-wide strategic plan should match service levels to user demand and affordability, especially for the urban poor. It should also integrate all components of the service system – minimization, collection, transfer and transport, recycling and treatment, and final disposal [13]. A strategic planning approach for medium size cities is also to be encouraged [15].

For smaller or weaker municipalities, there should be a focus on technical and financial assistance. Also, the economies of scale resulting from grouping smaller municipalities to share disposal facilities can significantly affect the affordability of services, particularly disposal operations. The main roles of central authorities should be to establish an appropriate policy and regulatory framework, carry out institutional reforms, and provide technical assistance and access to finance for local authorities.

The overall goal of solid waste management should be to collect, treat and dispose of solid wastes generated by all population groups in an environmentally and socially satisfactory manner using the most economical means available. In line with this goal, a comprehensive framework for solid waste management was developed as part of CWG activities (Schubeler, et al., 1996). The schematic approach to integrated solid waste management is shown in Table 2. The authors stress that all comprehensive projects must deal with these elements.

Table II.
Integrated Framework for Urban SWM

WHAT? (Functional Scope)	WHO? (Stakeholders)	HOW? (Strategic Aspects)
<ul style="list-style-type: none"> • Planning & Management <ul style="list-style-type: none"> - Strategic planning - Legal/regulatory framework - Public participation - Financial management - Institutional arrangements - Disposal facility siting • Waste Generation <ul style="list-style-type: none"> - Waste characteristics - Waste minimization • Waste Handling <ul style="list-style-type: none"> - Collection - Transfer, treatment, recycling and disposal - Special wastes 	<ul style="list-style-type: none"> • Local government • National government • Service users • Private sector • Informal sector • NGOs • Donors 	<ul style="list-style-type: none"> • Political • Institutional • Social • Financial • Economic • Technical • Environmental

(Schubeler, *et al.* [5])

An integrated urban SWM system starts with the collection and transport operations, and ends with final disposal in a sanitary landfill. These are the essential building blocks of any SWM system. In between, additional operations can be introduced such as transfer, resource recovery and recycling, and treatment (for example, composting or incineration). These additional building blocks make possible the differentiated management and recycling of wastes. Decisions about added operations will depend on both technical and economic/financial feasibility, as well as on social acceptability (as household and business participation is essential). These intermediate operations may also require that waste streams not be mixed indiscriminately, which in turn may necessitate household segregation and special storage, collection and handling of some waste streams – always at increased costs and requiring active household participation. Whatever recycling or treatment that may take place, there will always be significant residuals/rejects that require landfilling – typical recycling rates only reach 25-35% and may take a decade to achieve, while compost rejects are about 40-45% and incineration ash 15-20% of the original waste by weight. Markets for recyclables and compost must also be verified. These considerations point out the need for a comprehensive study of options, selecting the best mix of options based on affordability and cost-effectiveness criteria, and public education and participation as the basis for long-term success. As an example of such an integrated project in a developing country city, refer to the Belo Horizonte case in Box 1.

B. Better institutional arrangements

More effective institutional arrangements will involve putting in place inter-municipal and inter-sectoral coordination mechanisms. Inter-jurisdictional conflicts are a major concern, especially in metropolitan areas. In the absence of genuine metropolitan authorities with functional responsibilities for infrastructure planning and management, special agreements often voluntary in nature will have to be crafted among municipalities for the development of shared facilities for transfer and disposal.

Box 1: Integrated System of Solid Waste Management in Belo Horizonte

Beginning in 1993, with the advent of a new municipal administration, an integrated waste management strategy was formulated and implemented by the *Serviço de Limpeza Urbana* (SLU) of Belo Horizonte. Just four years later, Belo Horizonte's integrated system was fully functional and was

being held up by others as a system to emulate. The SLU strategy included the following three basic modules:

A *technological model*, based on the concept of differentiated management and recycling of wastes, provides an integrated and rational solution for such wastes as construction debris (that makes up 33% of the waste stream), organic wastes (25% of the waste stream), recyclable materials, and hospital wastes. Thus the technological model includes differentiated collection systems, three materials recovery plants, two construction debris recycling plants, a composting plant, and the conversion of the BR-040 landfill to an anaerobic bioreactor landfill which will extend its life from 2 to 18 years.

The second module focuses on the *modernization of SLU* and includes quality management based on worker participation, the introduction of efficient management instruments, and an intensive human resources development program.

Third, active *citizen participation* is promoted through a permanent dialog between SLU and the community, stressing concepts of mutual responsibility and accountability.

Source: Tavares-Campos and Abreu [30]

These agreements must include joint decision making mechanisms and cost sharing for facility financing and operation. Even for smaller municipalities, a shared sanitary landfill is economically attractive because of the high economies of scale and joint cost savings.

On the other hand, there is little need for joint municipal solid waste collection activities due to low economies of scale but significant economies of contiguity. Most municipalities can manage collection services on a decentralized scale, including the competitive contracting out of collection districts with private haulers. An illustration of this differentiated approach to collection, transfer and disposal is provided in Box 2 describing the Metropolitan Solid Waste Processing System (SIMEPRODESO) in Monterrey, Mexico.

Another institutional question in need of attention is to provide greater opportunities for public participation in the decision making process, especially for facility siting. Several Bank-supported projects have suffered major perturbations and time delays as a result of the NIMBY (Not In My Back Yard) syndrome which is as active in developing countries as in the industrialized countries. Dealing with NIMBY requires long lead times and the early involvement of the public through information and education campaigns, public hearings and a real role in decision making.

**Box 1: A successful example of metropolitan waste management in Monterrey, Mexico:
SIMEPRODESO (Sistema Metropolitana de Procesamiento de Desechos Sólidos)**

Created in 1987, with the support of a World Bank loan, SIMEPRODESO currently provides transfer, recycling and disposal services to 8 constituent municipalities with a total population of almost 4 million, and has recently expanded its area of activity to provide services to other municipalities in the state of Nuevo Leon on a commercial basis. Member municipalities remain with the responsibility of organizing their own waste collection services either directly or through private operators.

The initial investment for establishing SIMEPRODESO made during 1987-1988 was US\$10 million, with 43% financed by the World Bank loan, 32% in the form of federal grants, and 25% from state and municipal resources. Operational revenues come from tipping fees paid by municipal and private waste haulers. The company initially operated 3 transfer stations, 27 transfer vehicles, a state-of-the-art sanitary landfill, and weighbridges at transfer stations and the landfill. Today, the

SIMEPRODESO landfill receives over 4,000 tons per day, and additional facilities have been added including a 1,000 tons per day mixed waste recycling plant and a 7 MW capacity Landfill Gas-to-Energy (LFGTE) power plant. The LFGTE facility was financed in part by a GEF grant of US\$4.92 million, representing 43% of the total investment.

SIMEPRODESO can serve as an institutional model for waste management in metropolitan areas world-wide. It is a public decentralized (i.e., state-level) company operating on commercial principles. It has a Board of Directors whose president is the State Governor and is made up of representatives of the eight municipal mayors (3 serve at a time on a rotating basis), the labor union, the chamber of commerce and the industrial association. The main lesson learned in setting up SIMEPRODESO is that the major difficulties to be overcome are not technical, but institutional and financial.

Source: Bartone [31]; World Bank [32]

C. More efficient operational management through private sector participation

One of the proven ways of obtaining efficiency gains in solid waste management is through the involvement of the private sector – but only when the key success factors of competition, transparency and accountability are present [33]. The private sector improves efficiency and lowers costs by introducing commercial principles such as limited and well-focused performance objectives, financial and managerial autonomy, a hard budget constraint, and clear accountability to both customers and providers of capital. The private sector plays other important roles by mobilizing needed investment funds, and by providing new ideas, technologies and skills.

While there is ample evidence from around the world to support these claims [34], it is also clear that presently weak municipalities will have to build up their managerial capacity to effectively engage the private sector and manage the corresponding contracts and concessions. A toolkit for private sector participation has been prepared to assist municipalities in this endeavor [28].

A second form of private sector involvement is through the incorporation of micro-enterprises and informal waste recycling cooperatives in the urban solid waste management system. Research has shown that the promotion of micro-enterprises has proven to be an effective way of extending affordable services to poor urban communities [6, 7]. The promotion and development of recycling cooperatives also provides a way of upgrading the living and working conditions of informal waste pickers, resulting in higher incomes for them and greater self esteem.

Finally, there is a need to develop and complement technical capacity at the municipal level – whether it be for directly managing service operations or for contracting out and supervising private operations. World Bank and other donor-supported projects have found this to be a priority action without which project implementation can be severely compromised. Here too the private sector can play a major role in providing training and technical assistance for municipal waste agencies, and in preparing sound technical designs for integrated municipal waste management systems.

D. More effective financial management

In countries around the world, the costs of collecting, transferring and disposing of solid waste are often shared between those generating the waste (i.e., households, commercial and industrial establishments) and governments. Government cost-sharing arrangements include matching grants from higher levels of government and general fund subsidies from local governments. Matching grants are used to induce local governments to provide a socially and environmentally desirable level of solid

waste management, while general fund subsidies recognize the public good and equity aspects of solid waste management. Despite the prevalence of subsidies, adequate cost recovery is the key to both sustainability and private sector participation in solid waste management.

It almost goes without saying that one of the most important ways to improve solid waste management and finance is to improve the overall management capacity of municipal authorities and the corresponding municipal finance systems. In the latter case, it is especially important to improve service cost accounting and financial planning, in addition to introducing better cost recovery. Systems for full cost accounting must be established for effective cost recovery by local authorities. These accounting systems must have sufficiently detailed information to measure accurately the costs of operation and maintenance, billing, contract management (if appropriate), debt service and depreciation; and to distinguish among costs for residential versus commercial and industrial wastes. For these reasons, many Bank-supported solid waste management components are placed within broader municipal development or modernization projects.

User charges are commonly utilized to recover a portion of the costs of solid waste management from those generating the waste. User charges can generate substantial revenues and provide incentives to minimize waste, especially if structured so that those who pollute more, pay more ("polluter pays principle"). Although user charges can be imposed at different stages of solid waste management (including collection and disposal), in many cities they do not cover the full costs of solid waste management activities. While citizens and enterprises are generally willing to pay for solid waste to be collected, they are often unwilling to pay the full cost of disposing of the waste in a sanitary manner. Experience in many countries has shown that charging the full costs of disposal may create incentives for littering and open dumping, especially if the enforcement of regulatory standards (i.e. no dumping) is weak and entities can avoid paying the user charge by disposing of the waste themselves.

Analysis of the financial records of many developing country cities shows that current practices for cost recovery for solid waste are very weak (recovery rates of less than 10 percent are not uncommon) and have substantial scope for improvement. Options to recover the costs associated with solid waste management range from instituting or enhancing garbage taxes, collecting tipping fees, or relying on other general revenues (including the property tax and business licenses). Choosing among these options depends upon the relative importance of various criteria: whether revenues are adequate and easily collected, whether the polluter pays for the damage inflicted, whether the option is politically acceptable, and whether payment of the revenue can be enforced. These options and some of their tradeoffs are included in Table 3 below.

A more complete discussion of all of these financial issues is provided in a finance and cost recovery guideline and associated financial tools prepared for the Regional Solid Waste Management Project (RSWMP) for Mashreq and Maghreb Countries [35].

E. Improved environmental management

The closure of existing open dumpsites and the introduction of sanitary landfill is an urgent priority everywhere in the developing world. Even where complementary disposal technologies such as composting or incineration (waste to energy plants) are practiced, a landfill is still required and is the backbone of any sustainable disposal system. The World Bank and the CWG have produced guidance materials for the siting and design of sanitary landfills and the phased upgrading of dumps (Rushbrook and Pugh, (1999) and for leachate management and landfill gas management [21, 22].

Given the essential nature of the landfill for final disposal, and the lack of local experience and financial resources for introducing sanitary landfills, central government support in terms of technical

assistance and access to financing is needed in many lower and middle income countries. Matching grants designed to encourage landfill investments and sustainable operations may be an appropriate instrument to consider, primarily because the environmental damages and benefits tend to spillover into neighboring municipalities and regions.

As has already been pointed out, in the process of planning for and siting any disposal facility it will be necessary to anticipate the NIMBY syndrome and plan for public involvement in siting decision. Siting decisions also require the conduct of environmental impact assessments (EIAs) and the incorporation of recommended mitigation measures in the final design, construction and operation of the facility.

Finally, when planning for landfills, consideration should also be given to innovative design options like bioreactor landfill design for more rapid stabilization of biodegradable wastes with methane recovery and utilization. The latter point is particularly important given that the methane that escapes from landfills to the atmosphere is a potent greenhouse gas, but can also be a clean source of energy. Given the importance of reducing methane emissions world-wide, both the GEF and the PCF are supporting Landfill Gas-to-Energy (LFGTE) projects in diverse locations such as Monterrey (Mexico), Maldonado (Uruguay), Nova Gerar (Brazil), Santa Cruz (Bolivia), Durban (South Africa), and Riga and Liepaja (Latvia). To assist in the development of new LFGTE projects, the World Bank has also commissioned the preparation of a Handbook for project preparation [27] along with eight case studies of existing successful LFGTE projects.

Table III.
Options for enhancing cost recovery in developing countries

	Adequate Revenues?	Easily Collected?	Polluter Pays?	Politically Acceptable?	Enforceable?
USER CHARGES:					
• “Garbage Tax”	Can generate adequate revenues if rates are set based on costs, and are updated as needed	Often collected with property tax; Direct collection is expensive (about 10-13% of total costs)	Only to extent that rate depends on surrogate for waste generation, like lot size, property value	Requires political will to set and update rates	Difficult to withhold service for non-payment; Inefficient when collected with property tax
• Volume or Weight Based Fees	As long as fees are set based on costs and updated as needed	No, requires sophisticated refuse collection system;	Yes	No	Leads to dumping behavior without local inspection and enforcement capacity
• Tipping Fees (for use of disposal facilities)	Yes, if based on full costs of investment and operation	Yes, if weigh-bridges are utilized	Yes, if fees are passed on by hauler to waste generator	Municipalities are often reluctant to pay fair share	Yes, but must verify that trucks go to disposal site
OTHER REVENUES:					
• Property Taxes	Suffers from typical weakness in property tax collection	Yes	No, except to extent that property tax is surrogate for waste generation	Requires political will to collect property tax and update rates	Evasion commonly observed
• Business Licenses	Yes	Yes	No	Yes	Yes
• Utility Surcharges*	Yes	Yes	No, except to extent that energy use is surrogate for waste generation	Not easy to get utility cooperation; often legally challenged	Yes

• General Fund Subsidies (including transfers)	Yes, but at expense of other needs	Yes	No	Low political priority for disposal services	No guarantee that funds will be allocated
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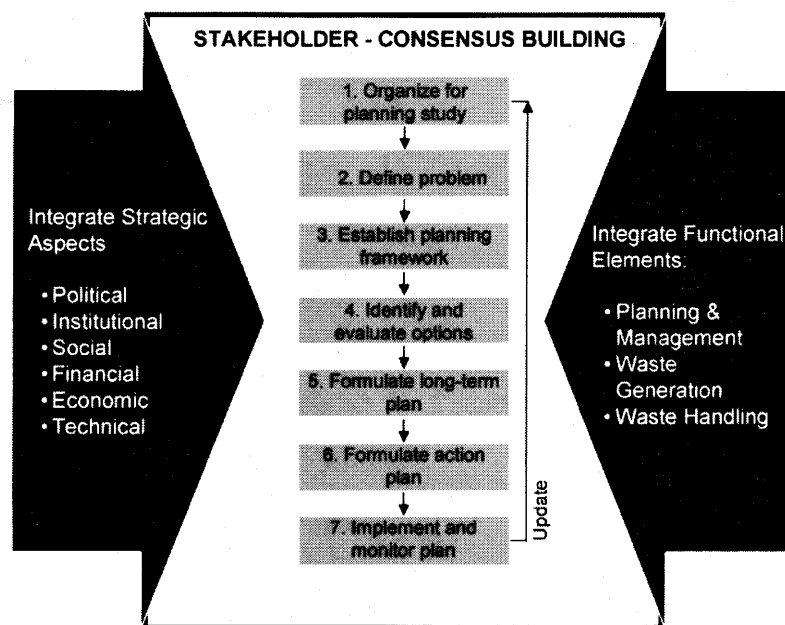
* For example, Ecuadorian cities are allowed to apply a 10-12% surcharge to the electricity bill; cities now have sufficient funds to significantly improve services, including contracting out.

V. Strategic Solid Waste Planning Approach

In recent years, the World Bank and donor partners have emphasized providing assistance directly to some 42 cities for the formulation of City Development Strategies (CDS). As a result of this exercise, many cities have identified solid waste management as a major priority for action. To further assist cities in moving from the broad recommendations of a CDS to the development of a detailed municipal solid waste management strategy and action plan, a Strategic Planning Guide for Municipal Solid Waste Management has been prepared [13]. It has been field tested in several cities, and is now being widely disseminated and taken up in the preparation of Bank- and other donor-supported projects.

The Planning Guide lays out a seven-step process of participatory planning (Figure 1) to arrive at an urban-wide strategy and action plan for an integrated waste management system for collection, transport/transfer, recycling, treatment and disposal. A strategic plan should match service levels and solutions to user demand and affordability, especially for low-income communities. It should also increase efficiency of the overall service, improve public health and standards of disposal, and contain costs and raise additional revenues so as to create a financial margin to allow progressive improvement in service quality. The strategic plan should adhere as closely as possible to the Agenda 21 principles for waste management articulated at the Rio Conference on Environment and Development -- universal coverage, safe disposal, waste minimization, and waste recycling. At the very least, it should move the city immediately toward the achievement of the first two of these principles and steadily toward implementing the latter two principles in the medium to long term.

Figure 1: Strategic Solid Waste Planning Process



Planning for municipal solid waste management is not primarily a technical issue, but involves the organization and management of relationships between all key stakeholders. Thus, it requires stakeholder participation and consensus building throughout the process. At each step of the process it is necessary to integrate both the strategic aspects and functional aspects of waste management (refer to Table 2). Finally, strategic planning is not a once-off or linear process, but an on-going exercise needing regular revision and updating.

By following through the seven-step process shown in Figure 1, there will be a systematic evaluation of a small number of alternative strategies leading to a preferred strategy for the long term. An action plan is then formulated to turn this strategic vision into a practical reality by identifying specific, detailed actions needed to implement the overall strategy in the short and medium term, including who should take the actions, when, and with what resources. This requires conducting detailed feasibility studies, the identification and sequencing of priority investments within the action plan, and the introduction of public awareness and education measures without which the plan cannot be implemented successfully.

A Strategic Plan is worthless unless it is implemented in practice and it results in demonstrable improvements on the ground. Hence, emphasis is put on moving from planning to implementation, revising and updating the plan, and introducing performance monitoring and management information systems. It is also vital to show early improvements on the ground in order to establish credibility with stakeholders. This can be done by urgently implementing any relatively small, simple to do, low cost measures identified during the initial planning process; and by including in the multi-year action plan an Immediate Action Plan for the first year. Some of the immediate actions should be implemented in parallel to the process of obtaining approvals for the overall strategy and action plan as the approvals are likely to take some time.

VI. Concluding Remarks

A few key points may best summarize the above discussion of decentralization and solid waste management:

- Municipal solid waste collection services are the easiest to decentralize even to the sub-municipal level, and affordable participatory approaches are often feasible.
- For greatest environmental and economic benefit, cooperative regionalization or metropolitanization of transfer, treatment, and disposal operations is often desirable.
- To become “good environmental citizens,” cities should manage their wastes better; and individuals and businesses should collaborate in the effort by reducing their waste generation and paying the cost of the service.
- The private sector, including micro-enterprises, can deliver high quality services through competitive and transparent contract or concession arrangements – the municipal government still remains accountable for service provision.
- Consider matching grants to deal with an “unfunded mandate” such as requiring environmentally sound urban solid waste disposal – because of the externalities involved.

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