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INTEGRATED DEVELOPMENT FOR WATER SUPPLY AND SANITATION

Managing solid waste in Addis Ababa

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ADDIS ABABA, THE capital of Ethiopia, is the largest as well as the dominant political, economic, cultural and historical city of the country. It is located at the heart of the country. Based on the 1994 census, it is estimated that the population of the city in 1999 would be 2,545,846.

Solid waste is an element of environmental pollution, which, in turn, is the contamination of air, water and soil by materials that interfere with human health, the quality of life and nature. From this perspective the enormous solid waste littering our city is one of the major areas of apprehension. Indeed it is one of the major public nuisances and the causes of morbidity in the city. For instance the report of Region 14 Health Bureau, compiled from the data obtained from 15 health centres for 1991, indicated that two of the leading top-ten causes of morbidity in the city were acute upper respiratory diseases and infections of skin and subcutaneous tissues. These accounting for one-third of the total outpatients. This demonstrates the effect of environmental sanitation on the health of residents.

Although this is appreciated by Region 14 Administration, practical solution seem still wanting for progress in this area is rather sluggish. There is an enormous task both for researchers and practitioners to tackle the problem.

Methods

The two principal methods employed in this study are critical observations and literature review. On top of personal life experiences, purposely-organised field tour to the major areas of focus in the city was carried out. The major areas focused include: 1) the only landfill site located at the southern tip of the city; 2) newly built residential areas in the eastern part of the city in the neighbourhood called Gerji; and 3) the inner part of the city including the roadsides. Besides literature review and secondary data are used.

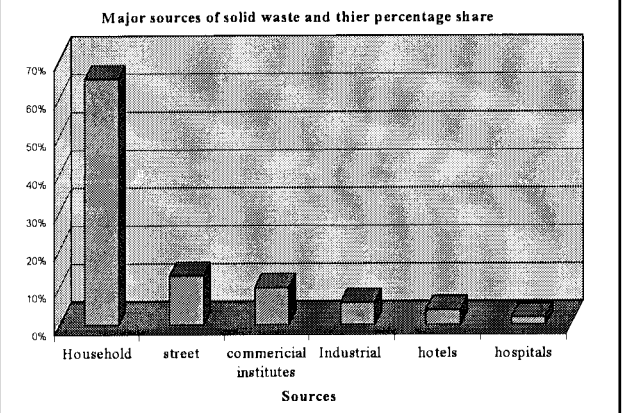
Findings and discussions

In 1993 the per capita solid waste generation per annum was estimated to be 0.168567m3. In 1999, taking account of population growth alone, the annual waste generation is estimated to be 429,146m3. Based on the five-year work program of Region 14 Administration, the total amount of waste to be collected per annum is set to be 65 per cent of the total volume generated in a year. If this plan materialises, there will still be about 150,201m3 of waste uncollected every year during the period. This demonstrates that in spite of the relative improvement in waste collection by employing more efficient means as planned, the volume of actual uncollected waste will continue to increase in proportion to the population.

Moreover, though research materials on the subject are scarce, the entire urban space confirms that managing solid and liquid waste is a matter of great concern. While walking in the city from any corner all public spaces like roadsides and open spaces attest eye-catching piles of garbage, flying 'festal' (which is increasingly used for packaging), rubbish, construction demolitions and moved-earth from new construction sites littering the urban space indefinitely. Obnoxious odours emanating from decomposing solid wastes, semi-liquid and liquid wastes are sickening all citizens.

The city council recognises six major sources of solid waste: households, street, commercial institutes, industries, hotels and hospitals. Available data for 1993 shows that household take the lion-share of solid waste generated in the city. The following graph shows the disproportionate share of household waste from total generated in 1993.

A human excreta is the major area of concern even from the household wastes. In 1984 about 30 per cent of the population of the city had no access to latrines. This proportion is estimated to have only slightly fallen to 29.2 per cent in 1997 in relative terms but the volume of excreta has imminently increased in absolute terms with proportional increase in the number of population over the years. Generally nearly one-third of the population of the city has no latrines and experiences open defecation. Hence human excreta takes proportionate share of the solid waste in the city. Moreover the available septic tanks used in latrines usually overflow and pollute most of the older and overcrowded inner city with no short-term solutions.



Graph 1

The city administration has plans to provide additional communal latrines. This is an important endeavour but apparently need huge resources and changing the attitude of people to use latrines. With this regard the government may exploit the potentials of local institutions like "edir" at least in the areas of public awareness creation and NGOs both in awareness creation as well as taking direct actions by drawing their attention to these particular problems and by providing conducive working atmosphere. It is obvious, however, that public latrines would serve only as short term remedies while long-term solution has to be sought through building sanitary networks at neighbourhood and city-wide levels.

Ash and smoke are the other major components of waste originating from households. Apart from lighting, electricity has never been an important source of energy for the larger proportion of households. The study conducted by Beyene indicates that firewood, charcoal, dung cakes and other traditional bi-products are the major sources of energy for domestic use (Beyene, 1992). For instance the 1994 census result indicates that the domestic energy requirements of about 47 per cent of housing units of the city is met from firewood and leaves, charcoal, cow dung and manure and combinations of all these and kerosene. The amount of ash and smoke generated through the combustion of these materials is immense. Dissemination and popularisation of energy saving appropriate technology products such as "lakech" stove will have tremendous role in reducing the amount of energy sources used and waste generated. This may need training the public on the use of appropriate technologies.

The other household waste worth consideration is "chat" which being increasingly used by most of the population of the city. It is consumed as a means of recreation by many people and serves as a stimulant. However the increasing number of people using "chat", its disposal in ditches, open spaces and drainage systems litter the entire urban area and block the drainage systems to the detriment of the environment and the health of the population.

Industrial waste is apparently insignificant. In 1993 it accounted for only 6 per cent of the total volume of waste generated in the city. Yet delay in the relocation of the much thought about abattoirs enterprise, now located in the centre of the built up area, pollutes the air and scenery of its environments. A mountain of animal bi-products (bones, horns etc.) with disturbing odour marks the compound of the abattoirs enterprise and its residential and business neighbourhood.

This signifies that although industrial solid waste is proportionally low, location factor and pollution control measures are yet to be adequately enforced. Although it is obvious that this particular instance has historical and economic reasons, its effects on the environment is undeniable.

The landfill site itself needs an attention. Landfill has impact on surface and ground water. Decomposition of organic materials produces different gases, which has effect on the air above. Hence proper use of landfill requires certain standard including spreading refuse in thin layers and compacting by a bulldozer before the next layer is spread. All the measures are meant to control contamination of surface and ground water as well as the air. Non of these practices are apparent in the landfill site of the city. Moreover it is unprotected where children, destitute women and youngsters scavenging for survival. Even this needs proper attention.

The increasing problem of urban waste management has its roots in history. When the city was built as an administrative centre in 1880s there was hardly any thought of waste as a potential threat. Neither the settlement pattern nor the mind set up of residents was in conformity with waste management issues. Haphazard physical development without regard for sanitary and utility facilities characterised the development pattern of the city even up to 1980s. Rural tradition of disposing waste, including human excreta, in the open air was instantly transferred to the emerging city to perpetuate to these days. Thus the current problems are, at least in part, the cumulative effects of the historical development patterns of the city through the century and the traditions of its people. With these features the expanse of the city space shows the immensity of the problem with high cost implications to ameliorate it.

Waste collection, either on door-to-door basis or communal collection has been the sole waste management method employed. The collected waste is usually dumped in the only landfill site located south of the city. The efficiency of this method is limited because of the capacity of the city council to deploy adequate number of vehicles and waste containers which, in turn, has direct relationship with revenue generation of the city. Other waste disposal methods such as composting of agricultural wastes, incineration and recycling of wastes are not used. Moreover, the city council alone engages in all kinds of solid waste collection.

The city needs to recognise the untapped opportunity of involving the private sector in areas such composting, recycling and even door-to-door collection of waste by introducing user-charges on sources and providing incentives for firms involving in these areas. It seems good to learn from other African countries like Egypt. Alexandria, the second city of Egypt, is a city producing enormous domestic and industrial waste. But by introducing innovative waste recycling methods, the city is reported to have turned the domestic and decomposable waste into "organic fertiliser or compost." The idea was latter picked even by the national government which led to establishment of composting plant in the city during mid-1980s (Human Development Report 1998, 1998:72). Human health and environment threatening waste turned into the most important environment-friendly agricultural input.

Although refuse collection and waste disposal is a kind of collective goods, which makes public role mandatory, there is room for regulated private sector involvement. Once recycling and composting are considered as methods of

solid waste disposal, there will be need to educated waste producers to keep agricultural (grasses, garbage, crop residues etc.) and recyclable waste apart from others at the sources for ease to pick by the institutions involved.

Enforcing the enacted regulations of waste disposal is the other area of focus. Two regulations were enacted for abatement of waste since the current government took office. Yet enforcing the regulations appears to be ineffectual.

The other area of focus is involving other public institutions. Public health related institutions, in particular, have a role to play. Educating the public not only on the effects of waste but also on the mechanisms of controlling waste generation, from the start, have much to help in solid waste management. Even the commercial and business sector need to be educated in this regard. Management of waste should not be considered just out in field alone but also at the source.

Recommendations

- Raise public awareness not only on the importance of creating healthy environment but also on the mechanisms of controlling generation of waste at the source, alternative disposal mechanisms and share of responsibilities between the general public, local traditional institutions, the business community, non-governmental and governmental institutions;
- Set up functional municipal structures at grass-roots level both to work with the communities and traditional institutions like 'edir' in educating the public on controlling generation of solid waste and its disposal as well as enforcing regulations enacted by the regional government. Dividing the entire area of the city into defined number of zones would serve for efficiency of solid waste collections.
- Establish additional waste disposal facilities like landfill sites and incineration facilities in all directions at accessible sites depending on the rate of solid waste generation. Creating conducive situations for controlling waste generation and providing mechanisms for managing disposal at the sources should be given more emphasis prior to enforcement of regulations. Enactment and enforcement of regulations, however, should not be compromised.
- Involve the private sector in waste management. 1) Provide incentives for private waste collectors by providing legal procedures which impose user-charges on sources and enforces restrictions on disposing waste in unauthorised spaces; 2) encourage private entrepreneurs to involve in recycling; 3) establish strong sanitary control systems and encourage private entrepreneurs in composting of agricultural waste.
- As commercial fuels are costly for low-income households, promote energy saving appropriate technologies through various means to minimise the biomass used for energy generation and hence ash and related waste production.

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