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Community-based solid waste management

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INTRODUCTION

1. Solid waste management is an important component of environmental quality control, with important social,economic and financial implications. However, for many developing countries such as Tanzania, this is just one of many passing public concerns. The priority accorded to it is usually low,competing as it does with other urgent needs such as provision of safe health for all, transport, etc. The municipal governments usually charged with responsibility for solid waste management have very limited resources to go around.Consequently,the level of service of the solid waste management systems is usually poor, making open heaps of uncollected rubbish an all too common sight in urban areas. Meanwhile, the magnitude of the task continues to grow year by year due to population increases, urbanization, and other factors. At the same time, the Tanzania Government for one continues to lay emphasis on the self-financing of municipal services due to the financial and budgetary contraints. It is almost certain therefore that solid waste management programmes will continue to suffer unless alternative approaches or solutions are found.

2. This issue therefore demands fresh attention. New approaches could lead to successful solutions, as shown by the case of the City of Porto Novo, in Benin, reported recently (ref.1). There, the stench from uncollected rubbish was driving residents from their homes, and one heap had grown as high as a four-storey building. A solution involving the people directly led to efficient collection and removal of the waste and composting it, using the product as soil conditioner for vegetable gardens. Given the continuing unfavourable economic and financial conditions in the country, involvement of the people will be a key factor for the success of solid waste management systems in poor countries. This paper offers suggestions for such a community-based approach in Tanzania.

CURRENT SOLID WASTE MANAGEMENT PRACTICE

The Example of Dar es Salaam

3. The present system for collection and disposal of solid waste in Dar es - Salaam provides a good study of the problems facing this service in Tanzania. Dar es Salaam is the largest city in the country,and was also the capital city until 1973 when the smaller but more-centrally located town of Dodoma was given this role. Administratively, it is one of the 20 regions of Mainland Tanzania, the city proper being governed by the City Council. The City Director serves as Chief Executive Officer supervising the functional heads of various departments, including the Health Department. It is this department which is responsible for solid waste management.

4. According to the study carried out in 1988 as partand parcel of the solid waste management master plan for the city (ref.2),the Cleansing Unit of the Health Department had some 800 personnel including street sweepers, vehicle drivers and attendants, and foremen. It also had some 30 tipper trucks, 3 container trucks and 30 containers. It was estimated that some T.shs. 30.9 million (i US.$=T.SHS.120 in 1988) was spent on solid waste management operational costs.

5. The amount of solid waste generated and collected in the city is shown in Table 1. As can be seen, the level of service is about 16%, which is very poor indeed. Many areas of the city are not served at all, the solid waste there is buried, piled-up and burned, or littered over the streets and open spaces. The collected waste is disposed of at Tabata dump, some 12 Kms from the City Centre.

Table 1. Solid Waste Generation and Collection in Dar es Salaam, 1988

From : Haskoning (ref.2).

WASTE CATEGORY	AMOUNT GENERATED (TONS PER DAY)	AMOUNT COLLECTED AND DISPOSED AT CITY DUMP (TONS PER DAY)	PERCENTAGE COLLECTED
DOMESTIC	650	50	9%
COMMERCIAL	45	35	77%
INSTITUTIONAL	60	10	17%
STREET	35	0	0%
HOSPITAL	20	5	25%
MARKET	200	45	23%
CAR WRECKS	25	0	0%
CONSTRUCTION	5	5	100%
INDUSTRIAL	130	25	19%
TOTAL :	1140	175	15.3%

NB: Figures for market and industrial categories include amounts by private collection as well as that collected by the city cleansing unit.

6. The problems facing the solid waste management programme can be summarized as follows:-

- Insufficient financial outlays,
- Shortage of trucks and other working equipment;
- Lack of proper working tools for personnel,
- Unfavourable organizational set up
- Poor community attitude towards environmental cleanliness; and
- Absence of a systematic approach.

7. The proposed master plan for the city (ref.2). suggests a phased improvement of the system maturing in the year 2009. The least expensive model entails an average annual operating cost of T. shs.203 million. This is a sum which is unlikely to be available locally in the present economic and financial circumstances. Even at the end of this plan, however, 28% of the city would still be unserved. The situation is similar, albeit on a smaller scale. A community-based approach is therefore necessary to supplement whatever action that can be undertaken by the municipal governments or local authorities.

8. COMMUNITY-BASED APPROACH

Principles

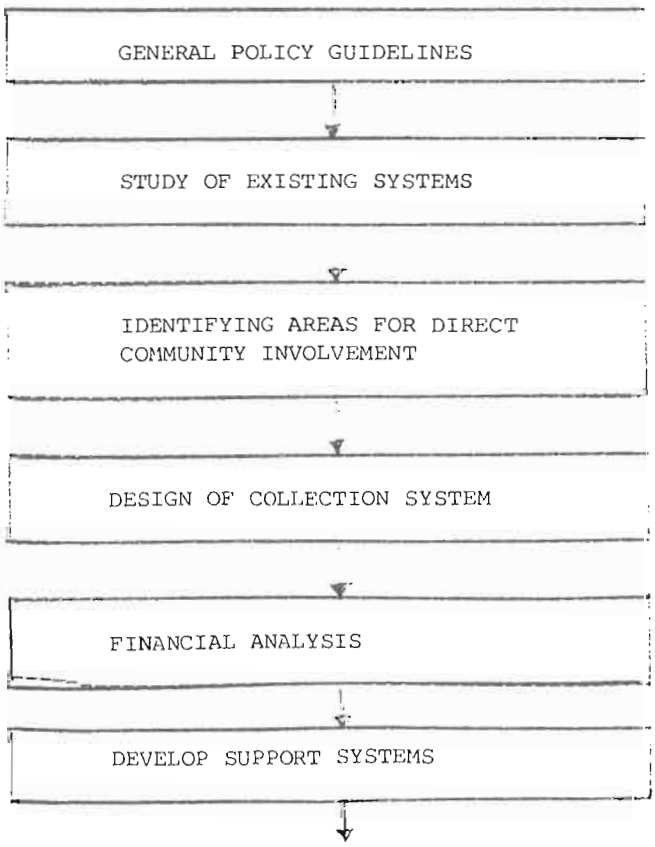
The community approach is based on the principle that the responsibility for collection and removal of solid waste should lie with the generators of the waste. Each generator of waste, house-holds, businesses, institutions, industries, etc. would be required to draw from their own financial or human resources to ensure that the waste is removed in accordance with guidelines set by the respective municipal Government or local authority. Each community or part thereof would organize itself suitably for the task, basing on the administrative system in place.

9. In general, waste generators would be encouraged to themselves arrange for collection, removal and disposal of the waste, and particularly so for industries and large institutions. The municipal government or local authority would provide technical assistance and general backstopping services for the success of the system, as well as monitoring and contro. Private enterpreneurs would be encouraged to operate at different stages of the system e.g. contracting with waste-generators to undertake collection and removal of their waste, manufacture/sale of standardized collection equipment or working tools, salvaging and recycling of solid waste. In all cases, appropriate designs should be identified and used (ref.3).

10. For residential areas, waste collection points will be identified. Location of these points or bins and their design, construction and maintenance will be done by the communities themselves. Households that cannot dispose the waste within their own sites would send it to the collection points. Groups of households in close estates or blocks of flats could engage a private contractor to undertake this primary collection. Secondary collection would be done by the municipality at a reasonable fee. In markets, the traders based there would have collective responsibility for the cleanliness of the market. They should engage market sweepers, and arrange for removal and disposal. A secondary collection employing the container system could also be used, in which case the municipality would charge a full-cost fee . Large institutions will be expected to themselves remove and dispose their waste, but public institutions could use the municipal services for a fee. However, they should be prepared to use other means such as private contractors if any when necessary. Generators of specialized waste such as industries and farms would be fully responsible to dispose their waste, they would be charged for using the municipal disposal site.

11. The municipal government would still retain broad responsibility for the system as a whole, providing operational and technical support including: primary/secondary collection from public areas and other selected parts; maintenance of municipal dumps; establishment of system guidelines and standards: providing technical information and advice to waste generators on proper techniques for dealing with the waste; monitoring compliance with established guidelines and initiating corrective administrative or legal action where necessary; and, spearheading public campaigns for community participation.

12. Implementation of this approach would involve a number of steps and phases, developed and executed with the participation of the communities themselves. At the outset, there would need to be the enunciation of general policy guidelines by the government ministry concerned with local government. Individual municipalities would then study their existing systems and operations identifying strengths and weaknesses, as well as categories of the various waste-generators. This should lead to a definition of the future areas for direct community involvement. The collection system would then be designed with close attention to the financial implications. Before the system can be implemented, the necessary support systems have then to be developed e.g. participation of private operators, manufacture or procurement of standardized waste bins, construction of communal storage points, etc. Afterwards , continuous evaluation and revision should be undertaken to make the system as efficient and as effective as possible. These steps are summarized in the figure below:-



13. Adoption of this approach will contribute to better solid waste-management programmes in urban and also rural areas. It would reduce operational burden to the municipalities, important because the collection costs can be as much as 80% of the operational costs (ref.4). It would enable proper removal of solid waste even from areas not served by the cleansing unit, and enhance the public's sense of responsibility towards environmental cleanliness in general.

References

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