

**Tanzanian Journal of Population
Studies and Development**



Vol. 12, No. 2, 2005

Community Participation Approach to Domestic Solid Waste Management: The Case of Morogoro Municipality, Tanzania*

Jumanne D.Kalwani*

Abstract

Most developing countries are facing resource constraints to cope with the provision of social services to their fast growing urban populations, which are mostly characterized by poverty and ignorance. One of such constraint of concern is lack of adequate solid waste management services. Large quantities of uncollected garbage pollute urban environment and cause ill health to the community. This study collected data on community participation in domestic solid waste management in 1995 at Chamwino spontaneous settlement in Morogoro municipality. A sample of 100 out of 500 households was surveyed. Structured questionnaire survey and participatory rural appraisal (PRA) related approaches were applied to investigate the extent Morogoro municipality (hereinafter 'the Municipality') involve local communities in domestic solid waste management. Findings from the study show that the Municipality, which is the sole provider of the garbage management services, neither performed this service efficiently nor fully involved community to support it. Also, the study found that the community had the mentality of waiting for the Municipality to provide most of the domestic solid waste management services in reciprocation to the various taxes collected from it. Only 28% of the residents partially participated in domestic solid waste management as compared to 72% who resorted to illegal dumping of garbage when municipal services declined. Also, 'effective communication', as defined herein, lacked in the rarely organized meetings between the community and the Municipality to discuss garbage issues. All these factors accounted much for the serious problem of unattended garbage, especially in the spontaneous settlements. This study thus underscores the importance of community participation by bringing together the Municipality and local community in participatory forum to discuss domestic waste management problems and suggested appropriate solutions.

1. Introduction

It is indisputable fact that the rapid urbanization presently occurring in the less developed countries (LDCs) is without sustainable economic growth. It has subjected cities and municipalities to many social economic crises. One such problems and the concern of this study is failure of municipalities to cope with the provision of social services, *inter alia*, collection of garbage especially in spontaneous settlement that form over 70% of the urban residential areas (Halla &

* This article is re-published because of a technical error that appeared in the previous in the previous volume of the journal - Chief Editor

* Department of Geography, The Open University of Tanzania

Majani, 1999). As a result, heaps of uncollected or haphazardly dumped garbage are a common eyesore polluting urban environment, where the majority poor work and live. Consequently, environmental related diseases—e.g., cholera, dysentery, worms, etc.—are endemics afflicting human life and cause of high mortality in LDCs. Often at this critical stage resource-constrained municipalities intervene through short-lived campaigns in the form of environmental cleaning crisis management, followed by temporary relief before the environment worsens again with uncollected refuse and the vicious circle of filth-disease-causal effect reoccurs.

The low economic and technological levels of LDCs make them not to opt for advanced solid waste treatment technology as applied in developed countries (DCs), e.g., gigantic recycling plants and incinerators. These are too expensive and uneconomic methods for LDCs in terms of overhead costs involved in treating the relatively less waste generated in the latter's municipalities as compared to that in DCs. A single municipal incinerator facility in DCs cost over US\$300 million (Cunningham & Saigo, 1997). Therefore, governments in LDCs should look for cheap but cost effective technology alternatives. For example, governments need to provide incentives to recycling, and to fund pilot programmes such as small scale and cottage based recycling industries, compost production, irrigation using treated sewage, and the recovery of energy from wastes (Common Future, 1994). Involving local communities themselves who are the generators of garbage in their own environment but the ultimate beneficiaries of the same if it is kept aesthetically clean could be a good starting point (Kalwani, 2001). Case studies worldwide have shown that when fully involved in solid waste management local communities can improve the environment, while providing them with extra social economic benefits. Since the 1970s China has been promoting the use of garbage and human wastes to process rural organic wastes. For instance, 5,000,000 households use anaerobic digesters to produce biogas as cheap energy, and to produce natural fertilizers used in agricultural production (City Farmer, 2001).

It is argued that human beings as thinking creatures should be self-reliant and master of their own destination. In this respect, they cannot be developed but can be empowered with knowledge to explore and exploit more of the environment for their development (Nyerere, 1974). Since the late 1980s the UN Centre for Human Settlement (HABITAT) urged LDCs' governments to prepare a ground for local community involvement in almost all social economic walks of life, including solid waste management. Specifically, governments should look on how they can handle the many problems of large numbers of poor people concentrating in cities and towns; and how they can provide autonomy for community and groups to initiate and carry out development activity (World Resources, 1988/89; Majani, 1994). These arguments suggest that community participation in solid waste management and other social services is timely, particularly during this era of economic liberalization where self-reliance as opposed to dependence on government in providing the same social services is highly emphasized.

However, it is still a normal practice for urban governments in LDCs to perform the whole process of solid waste management alone, or occasionally contract private

companies. The key stakeholders—in this case urban households—being the main source of garbage generation are partially or not at all involved in the entire solid waste management process.

According to public health definition, domestic solid waste management includes the following five processes:

- (a) Generation or source of garbage
- (b) Sweeping it from dwelling units and streets
- (c) Assembling the waste at approved collection points
- (d) Transporting it to authorized dumpsite or to a treatment/recycling plant
- (e) Final disposal of the waste at a properly managed dumpsite.

In most cases community involvement is partial, such as removal of garbage from dwelling units to collection points where municipal or private trucks transport and dispose of the waste to dumping grounds. It can be said that holistic community involvement in solid waste management is a gray area in Tanzania because it is not adequately explored. As a result, possibly most of the disadvantaged households especially in the spontaneous settlements do not know why they should participate in solid waste management. The foregoing observation prompted me, back in 1995, to design and apply a community participatory project to a spontaneous urban settlement affected by failure to collect garbage, thus causing environmental pollution problem and its manifestations including human ill-health and deaths.

This study adopts a United Nations definition for community participation as people in a defined geographical and administrative locality closely involved in the economic, social, cultural, and political process that affect their lives (Human Development Report, 1993). The scope of this study is to explore the extent Morogoro municipality involve fully disadvantaged local communities in all processes of domestic solid waste management to keep their environment clean, in the process complementing its financial resources that are overwhelmed by rapid urbanization. We place emphasis here on the methodological aspect of involving communities in human development ventures, which are specifically, employing participatory methods of data collection; creating public awareness; and examining and discussing with stakeholders the basic processes of garbage management. Above all, the study shows how intervention founded on a participatory decision making process can alleviate the underpinning garbage problem facing the community. While it is beyond the scope of this study to discuss the processes involved in converting garbage to compost, it shows how once poor communities are approached in the right way they can initiate the course of self-development.

1.1 Objectives of the Study

Using the case study of Morogoro, this study employs a participatory rural appraisal (PRA) approach combined with logical framework workshops to study local urban community participation in solving the problem of garbage management for the betterment of the community in the study area.

1.2 Theoretical Framework

There is no universal theory that can alone exhaust the concept of community participation (CP) in human development. Instead, one should amalgamate scattered bits of knowledge about the concept from motivational, behavioural and other social and natural scientific theories. For instance, 'communication' which, simply refers to exchange of information between the sender and the encoder is a key word to community participation in the sense that without it no human interaction can take place effectively. A renowned social scientist, Paul Freire categorizes communication into two types, namely, 'participatory or effective' and 'non-participatory' dialogues (Kinshaga, 2000). He studied these under classroom situation, i.e., teacher-learner interaction. Freire defines effective dialogue as a two-way traffic information exchange between two parties. The role of the teacher in this face-to-face interaction is to facilitate the learning process. On one side, the teacher should not regard him/herself as the 'source' of knowledge, and learners as 'empty boxes' to be filled in with knowledge on the other side. Instead, each of the two parties should be willing to learn from each other in a mutual interaction medium. The benefits of this kind of dialogue is that the teacher gets feedback instantly from the learners, while the latter share their views with the teacher in a friendly atmosphere which motivates the learning process. On the contrary, non-participatory dialogue is simply the opposite of the participatory one. In this case, it impedes the process of effective learning or communication where full participation in human development is required.

Freire's model of communication can be evoked to study various social, economic, political, and cultural interrelationships between a given local community and government or other institutions that aspire or claim to practice CP. Experience shows that where full participation of communities in projects is ignored or overlooked—for instance, in urban domestic solid waste management—usually the problem of unmanaged garbage occurs. Like in most of LDCs urban governments, the Dar es Salaam City Council's (DCC) resources are equally overwhelmed by rapid urbanization to render efficient social services, including domestic solid waste disposal services especially in spontaneous areas (Halla & Majani, *op cit.*). This made the DCC to opt for CP besides privatization strategies of garbage service delivery. However, the CP approach in domestic waste management greatly lacked, among other things, effective communication component; and has hence failed ever since it was introduced in 1992 to-date. As Majani argues, the strategy failed due to the DCC behaving like 'governors' issuing directives from the top down to the bottom—or what he termed as the 'governed'—for decision consumption (Majani, 2000).

Participatory rural appraisal (PRA) approach is an alternative way of handling CP oriented projects as proposed by some authorities. PRA can be defined as a fully participatory exercise, which involves the community in preparing its own solutions (Devavaran, 1994). Originally, PRA used to appraise rural community oriented projects. However, it is now increasingly being adopted in handling diverse social science research problems both in rural and urban areas. Its two-way traffic flow between the researcher and respondents make it one of the best ways

of studying social groups because the interpretation of social groups can easily be captured and interpreted (Chamber, 1999). It works well if it is combined with some other approaches such as logistical framework workshop. The latter refers to a forum that motivates participants, guided by a researcher, to brainstorm over their own community problem and reach a concerted solution. The approach was employed successfully in a study entitled "A Paradigm for Community Wildlife Management in Serengeti Region Ecosystem" (Kauzeni, 1995). In this study the local communities living around this national park were fully involved in coming up with concrete proposals that culminated in minimizing poaching in the area. Moreover, these formed the basis for drawing the country's community wildlife management policy. Of recent, a research successfully applied PRA in studying the contribution of herbal medicine to the welfare of local communities surrounding Duru-Haitemba in Babati District, Tanzania (Otieno *et al*, 2001).

On the basis of the above discussion, this study employed a combination of PRA and logistical framework workshops, enriched with Freire's 'effective dialogue' method of communication to study Morogoro municipality on CP in issues related to domestic solid waste management in its spontaneous settlements like Chamwino.

2.0 Materials and Methods

2.1 Study area

This study was carried out at Chamwino in Morogoro municipality, which lies between 6°35'S and 6°57'S; and 37°33'E and 37°50'E (Figure 1). It has a total population of 228,863 people constituting 54207 households (National Population Census, 2002). Chamwino is one of its outskirts located in the western fringes of the municipality's central zone, bound by the Dar es Salaam-Mbeya highway to the east. Like other LDCs' spontaneous settlements, Chamwino is characterized by slums owned or rented by majority low-income earners who subsist through self-employment in the informal sector. By 1995 the area had a total population of 15,000 people who formed 500 households (Municipal Records, 1995). However, the population is now been extrapolated to around 19000 using a 2.6% population growth for Morogoro urban district (National Population Census, *Ibid*). Around three-fourth of the population is made up rural-urban migrants, attracted by various social economic 'urban lights', i.e., pull-factors based in Morogoro municipality including expected employment opportunities in its industries – e.g., ceramics, canvas, polytex, and shoe factories established as part of the national industrial growth pole grid of 1969. Self-employment includes small scale peri-urban farming in the western fringes of the municipality, mainly practiced by the majority poor mostly with only primary education. Other self-employment activities include food kiosks run by food vendors which are mostly women (*Mama Lishe* in Kiswahili), liquor brewing, herbalists, charcoal vending, to mention a few. Also a small but steadily growing section of the population, mainly the jobless, indulges in social delinquencies like organized crimes, prostitution, etc. in order to scratch a living.

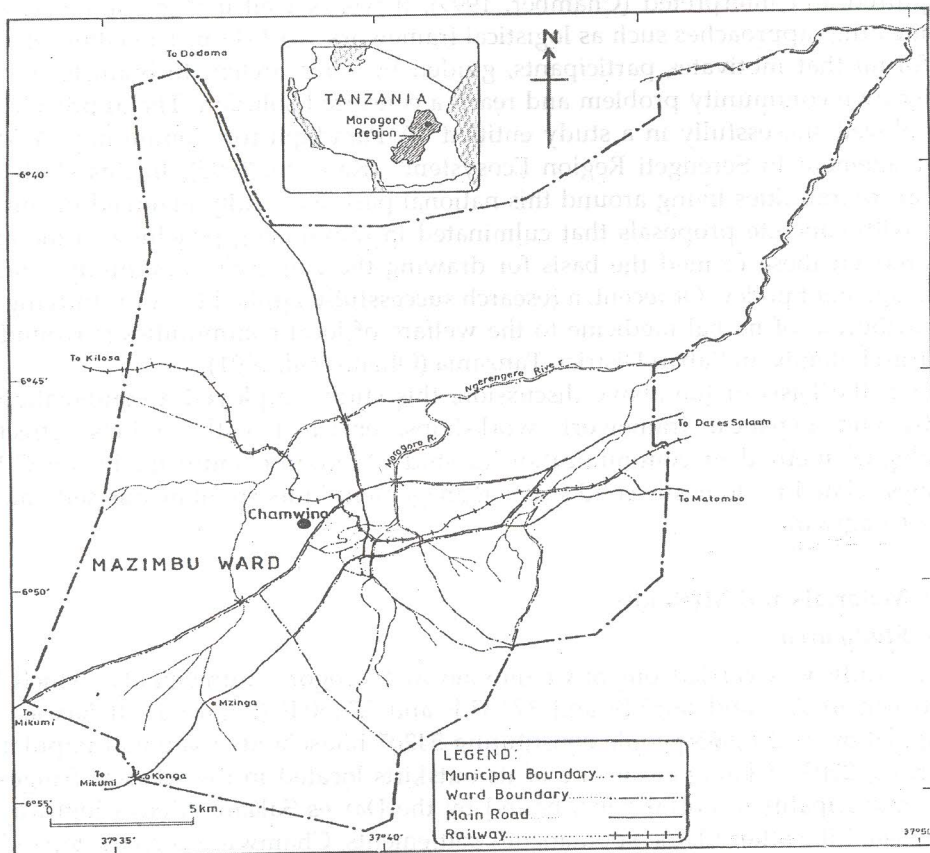


Figure 1: Map of Morogoro Municipality showing the location of Chamwino

Chamwino, like many other spontaneous settlements in LDCs, is an unplanned suburb, and therefore has no legal entitlement to the Municipality's social services delivery, including garbage collection. In principle, the services cannot be demanded legally by respective residents from the urban government but can be provided on compassionate grounds. Nevertheless, Chamwino occasionally and partially received the garbage collection service from the Municipality. As a result, heaps of decomposing domestic wastes along the streets and unauthorized open dump near Tupendane market, which is in the middle of the settlement, continually polluted the urban environment unabated. Consequently, environmental associated diseases, especially cholera, frequently break out. For instance, in 1993 cholera caused substantial human mortality before the municipality's *ad hoc* intervention to arrest the situation temporarily.

2.2 Methods of Data Collection

Two main methods were employed in obtaining information for the study. Firstly, we used a baseline survey using a PRA method, together with a conventional questionnaire to collect information. The purpose was to study the degree of the garbage collection problem, and also to investigate to what extent the Municipality involved local communities in domestic solid waste management. The variables studied by interviewing the heads of households or their families participation in garbage management included:

- ◆ per capita generation of garbage;
- ◆ daily sweeping of garbage within a household;
- ◆ hauling garbage from household to a nearby Municipal authorized collection point;
- ◆ transportation of garbage from the collection point to authorized dumpsite;
- ◆ proper disposal of garbage at the dumpsite as required by public health regulations;
- ◆ recycling garbage; and
- ◆ any other unauthorized treatment of garbage, e.g., burning in open air, indiscriminate burying, etc.

We also extracted variables concerning the educational and income levels of heads of households to see whether they have impact on CP in domestic solid waste management. In addition, we sought from the respondents explanations arising from the above variables by applying PRA techniques including informal effective dialogues and observation.

Secondly, we employed the PRA method and logistical framework workshops as discussed under the theoretical framework above at two stages. The first stage comprised of public awareness creation and sensitization through public meetings, organized by the help and consent of local government leaders. These meetings and the baseline survey went on for two weeks simultaneously. The aim was to dialogue effectively with the community so that it could see garbage as one of the top priority social economic problems needing urgent solution. We emphasised on the importance and need for elementary public health education; and the effects of environmental pollution to the community itself. The second stage focused on bringing together the community and the Municipal representatives in the logistical framework workshop in the field of CP in various social economic projects. The workshops took place in the last two weeks of the study, i.e., after the survey and public awareness meetings. The main agenda was to learn, through free exchange of information between the Municipal representatives and the community, the common problem of domestic solid waste management with a view to reach a concerted solution. We used plenary discussions and group work techniques to promote full participation of members of the community both in public awareness creation meetings and the subsequent workshops.

We applied random sample to 100 households along Tupendane Street to collect data related to the mentioned variables. Random sampling was chosen due

to its renowned quality of giving equal chance to every member in a population to be picked for study or other rational purposes. In this case, all heads of households in every 10th house, or 'dwelling unit', were selected and interviewed using questionnaires along with PRA methods. For convenience and consistence we also collected garbage from every 10th dwelling unit using plastic bags; daily weighed and recorded the data for seven days using research assistants involving community members. The average weight of garbage in kilograms was divided by the number of members of the picked households to obtain the per capita generation of garbage per day.

We applied the following reliable environmental empirical model, which is widely used in various studies done on estimating generation of solid wastes in developing countries (see, for example, Hoskoning, 1989; and Kalwani, *op ct.*):

$$Gr = T/Po$$

Where *Gr* is generation rate of garbage in kg per capita per day (kg/c/d);

T is total garbage collected and weighed per day in all households covered in the sample; and

Po is total population of all households covered in the sample.

The model was applied to compute two variables namely, calculating the per capita generation of garbage/day for the 1995 Morogoro Municipality Survey; and estimating the amount of garbage likely to be generated/day by year 2004. For that matter, the 1995 Municipality average per capital day generation of garbage (0.87 kg) was taken as a constant computed with the average population growth rate of 2.6% for Morogoro region (National Population Census, 2002). The purpose was to see the effect of population increase (1995–2004) on domestic solid waste production, assuming per capita garbage generation remains constant but population is allowed to vary (Refer the above model).

2.3 Data Analysis

We employed measures of central tendency to analyse the distribution of the various responses received in the field, and used descriptive statistics to analyse data based on the percentage of responses. Where responses clustered it implied a popular opinion or concern and vice versa. Finally, these responses were triangulated through consensus and resolutions reached during public awareness creation meetings, logistical framework workshops, and our participant observation during the survey.

3. Results and Discussions

3.1 Findings from the Baseline Survey

(a) Per Capita Generation of Domestic Solid Wastes /Day

Every 10th dwelling unit selected for the estimation of per capita generation of garbage was provided with 1 big plastic bag of a 10 kg capacity for depositing its garbage for the whole day. The number of occupants in each household were

counted and recorded. The following day the wastes were collected by the help of research assistants and community members, then weighed and recorded. New bags were issued to the respective households for the next day collection, and the exercise went on repeatedly for a whole week. Finally, the average weight was computed and divided by the number of households' members to obtain the generation of garbage per capita. The results were as shown in Table 1.

Table 1: Per capita generation of garbage / day and projections

Selected dwelling units	Total no. of family members under one roof		Average of garbage generation per day (kg)		Average per capita generation of garbage/day (kg)
	(i) 1995	(ii) 2004 ¹	(iii) 1995	(iv) 2004 ²	
1	24	30	21.3	26.1	0.88
2	21	26	18.8	22.6	0.89
3	19	24	16.8	20.9	0.88
4	17	21	16.0	18.3	0.94
5	20	25	16.6	21.3	0.83
6	17	21	15.4	18.3	0.90
7	14	17	11.1	14.9	0.79
8	15	19	13.2	16.5	0.88
9	23	28	20.7	24.5	0.90
10	21	26	17.6	22.6	0.83
Total	191	237	167.5	206.2	0.87

Notes: ¹Population projection from 1995 to 2004 computed using an average growth rate of 2.6% p.a. x 9 years for Morogoro (National Population Census, 2002:59).

²Projected garbage generation per day by the year 2004 obtained by using average per capita generation of garbage amounting 0.87 kg (1995 Morogoro Municipality) as a constant.

Table 1 shows that each dwelling unit had several households with a total population of 191 people who, on average, generated a total of 167.5kg per day. Therefore, garbage generation per capita at *Tupendane* was 0.87kg per day. According to the model, this was obtained by dividing column (iii) (*T*) by column (ii) (*Po*) is equal to column (v).

(b) Projection of garbage generation by the sample population to 2004

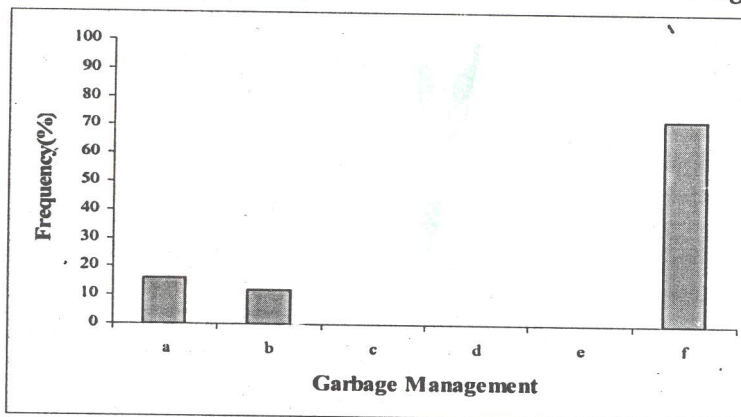
The per capita generation of garbage of 0.87kg used as a constant (*Gr*) under column (v) was multiplied by column (ii), which included an average population growth rate (*Po*) of 2.6% per annum (1995-2004), to get the total garbage generation per day (*T*) in 2004. These results are given in column (iv) on the basis of: $T = Gr \cdot Po$.

The results show that population in the sampled households increased by 24% (from 191 to 237) between 1995 and 2004, while garbage generation per day increased by 23.1% (from 167.5 to 206.2kg) in the same period. The projection suggests that there is direct relationship between population increase and generation of domestic solid wastes in the study area almost at equal proportions.

(c) *Community Participation in Domestic Solid Waste Management*

In this section, we used the 1995 Morogoro Municipality Survey's data instead of projections for analysis because we wanted to come up with concrete experience as physically observed, diagnosed, and discussed during the survey. All the 100 households of the random sample were covered during the survey as planned. The study arbitrarily used the head of household's educational level associated with income as a rough criterion to divide the findings into two main categories.

The first category composed of heads of households who achieved above primary to secondary education. Such category included low cadre staff, e.g., messengers, primary school teachers, clerks, industrial workers, etc., and comprised 20% of the sample population. These constituted 16% of the households that daily swept their houses/compound; and partly 12% that hauled garbage from households to shallow pits for temporary or permanent disposal (Fig. 2). In total, this formed 28% of households that partially participated in domestic solid waste management.



Legend:

- Sweeping house/compound daily.
- Hauling garbage from house/compound to collection points daily.
- Transporting garbage from collection points to authorized dumpsite.
- Disposing garbage at the dumpsite as required by law.
- Recycling garbage in lieu of disposing it at authorized dumpsite.
- Resorting to haphazard dumping or other illegal treatment of garbage e.g. burning in open air.

Figure 2: Community Participation in Domestic Solid Waste Management in Morogoro Municipality

The income acquired from low salaries or petty-business by this category enabled most of its members to hire domestic servants who, among other domestic works, swept garbage and threw it into substandard pits. In reality, it was observed that there were no standardized 'garbage collection points' approved by the municipal authority. These shallow pits were dug at the discretion of house lords or tenants. Actually, they acted as 'small dumpsites' instead of collection points for garbage in transit to authorized dumpsites. Moreover, there was no waste classification

whenever the waste was thrown into the pits. Community members simply emptied any kind of waste—e.g., rags, food leftovers, vegetables, expired medical drugs, disposable syringes, plastics, rubber, metals, broken glass, etc.—into the pits. Vectors of environmental diseases like rats, strayed dogs, uncared chicken, etc., could vividly be seen scavenging around such scenes, thus increasing the chances of the outbreak of epidemic diseases at any time.

The second category included cases of illiterate or non-formal/primary education achievers, which formed 80% of the total respondents. Out of these, 96% reported to have partial information about health hazards, e.g., epidemic diseases, caused by a polluted environment through primary and/or public health education delivered once per fortnight by a community worker. These formed 72% of the cases of those who resorted to throwing garbage haphazardly or other illegal forms of treating/disposing of domestic solid waste (see Fig. 2). This prompted the study to find out why even those with some elementary knowledge on public health behaved contrary to expectations.

The survey shows that 89% of total respondents revealed that the municipality did not provide them with any vehicle to collect and dispose of garbage. The alarming high percentage of non-participation of households in some garbage management activities—i.e. 0% in *c*, *d*, and *e* as indicated in Fig. 2—raised concern. The community cited various social and economic reasons, including poverty, which led to this situation. Poverty barred them from hiring vehicles to transport wastes to authorized dumpsites. Moreover, faced with the choice whether to invest in garbage and other social services or starve, definitely the poor will opt for the latter. Also, we noted that a substantial number of the respondents had the attitude of waiting for the Municipality to undertake almost all garbage management processes for them.

From these findings, we concluded that the study area faced a serious garbage problem. The Municipality did little in supervising and putting in place mechanisms of enhancing full community participation in domestic solid wastes management. This is partly substantiated by the zero percent score in other variables of CP in garbage management (see Fig. 2). These issues are further highlighted from discussions following the logical framework workshops between the community and the Municipality representatives.

3.2 Discussions from public meetings and Logistical Framework Workshops

Invited experts on CP in projects facilitated the meetings and workshops through presentations focused on the baseline survey findings. Then group and plenary discussions among community members and Municipal officials provoked hot debates. Among many issues discussed, two burning issues cropped up. Firstly, it was acknowledged that little or lack of knowledge contributed much to the filthy environment because most of the residents had at least primary education and/or elementary public health education. Also, it was established that the community

partly had the attitude of waiting for the Municipality to collect garbage for them in reciprocation to the numerous taxes it collected from the people. Similar urbanites' attitudes were also reported from various studies (see, for example, Kalwani, 1994). In a study conducted in Dar es Salaam, Chaggu (1996) observed that provision of free solid waste management service since the colonial to socialist Tanzanian governments had the effect of crippling and instilling in the minds of the people the attitude that the government will provide for the entire infrastructure needed.

Secondly, the community wanted to know why the Municipality could not collect garbage despite the various levies it collected. The municipal team explained that, being an unplanned settlement, Chamwino was not accessible by municipal sanitary trucks. The community challenged this by questioning how the same vehicles occasionally reached the area and collected wastes during the crisis times, e.g., the short-lived anti-cholera campaigns. In view of the various issues raised, the Municipality was advised, among others, to put in place a mechanism with a poverty alleviation component to enhance full community participation in domestic solid waste management and other human development activities. Also, the community acknowledged the municipality's budget constraint to meet the great demand for social services of the rapidly growing urban population that far exceeded Municipal resources, leading to 'poverty sharing' among the majority urban poor.

Finally, it was agreed that the permanent solution to the problem of domestic solid waste management facing the community should be sought through concerted and regular participatory forum with the Municipality. Given the ailing financial position, the community and the Municipality agreed to complement each other's effort to attain a clean environment.

Several options of controlling domestic solid wastes were exposed to the community by different experts in the course of discussions. One of such options that impressed the community was converting garbage to compost. It was explained that compost formation is a dynamic, biological process whereby a mixed microbial population converts heterogeneous organic matter into a stable humus-like product used as a soil conditioner and fertilizer. Regarding the high price of industrial fertilizers, organic waste streams products generated in urban and peri-urban areas could be used as valuable nutrients for crop production, urban gardens and recreational areas. The expensive industrial/artificial fertilizers seriously lack these qualities (City Farmer, 2000). Moreover, converting garbage to compost is common in various parts of the world as a measure of keeping the environment aesthetically clean. Literature on urban agriculture frequently show that city farming often absorbs urban wastes, thus reducing the volume of waste and the need to collect and transport wastes to distant dumps (City Farmer, 2001). In practice, urban farmers in many cities acquire municipal waste as a resource. In view of the above explanations, the Chamwino community agreed to undertake a CP project for converting garbage to compost not only as a way of containing the garbage problem, but even more importantly, to obtain cost effective fertilizer for their peri-urban farms.

6.0 Conclusion

This study has shown that there is a serious domestic solid waste management problem in Morogoro municipality, especially in spontaneous settlements. This is partly explained by the influx of illiterate and semi illiterate rural-urban migrants flocking into the city seeking jobs and better amenities. As a result, such heavily settled areas with low income earning households overwhelm the municipality's limited resources to provide domestic solid waste management. The financial stress of municipalities, however, should not be the excuse for rampant piles of garbage continuing to pollute the environment at the expense of the welfare of the poor living in spontaneous settlements. Municipalities can institute appropriate mechanisms that can enable poor local communities to participate fully in domestic solid waste management. This study has shown that one of the contributing factors to the solid waste management problem in the study area was lack of full community involvement.

This study has shown that when the community, as the main stakeholder, is marginalized in terms of involvement in decision-making on issues pertaining to their environment, then CP in domestic solid waste management is either partial or impossible. But when communities are fully involved through acceptable approaches they can contribute in solving their environmental problems. Conversely, this study has shown that PRA, combined with public awareness meetings, logistical framework workshops, and participatory dialogues can be an effective approach for CP in domestic solid waste management. Lastly, the case of Morogoro is a contribution and benchmark to further research for improved approaches on CP in domestic solid waste management in urban areas. Emphasis should be on the need to develop such community-oriented projects to sustainable level by taking into consideration other linkages in the society, including poverty alleviation.

References

- Chamber, R. 1999. *Relaxed and Participatory Appraisal. Notes on Practical Approaches and Methods.* Department of Development Studies. University of Sussex. Brighton UK.
- Chaggu, J.E. 1996. *The Colonial Mentality.* NEMC & UCLAS Workshop Proceedings on Solid Waste Management held in Dodoma, Tanzania: 25-30 November, 1996.
- City Farmer. 2001. *Anaerobic Digestion in Rural China.* Office of Urban Agriculture: City Farmer.

- . 2000. *Municipal Organic Waste Recycling for Urban and Peri-urban Agriculture in Africa and Asia*. Canada's Office of Urban Agriculture: City Farmer.
- Cunningham, W.P., & B.W. Saigo. 1997. *Environmental Science: A Global Concern*. New York: Mac Graw Hill.
- Devavaran, J. 1994. *Training Notes for Participatory Rural Appraisal*. Institute of Continuing Education. Sokoine University of Agriculture, Morogoro, Tanzania.
- Halla, F., & B. Majani, 1999. Innovative Ways for Solid Waste Management for Dar es Salaam: Towards Stakeholders Partnership. *Habitat Intil*. 23(3): 351-361.
- Haskoning & M-Konsult Ltd/Ministry of Water, Department of Sewerage and Sanitation. 1989. *Master Plan Project on Solid Waste Management for Dar es Salaam. 1989-2000, Vol. II*.
- Kalwani, J.D. 2001. The Effect of Rapid Urbanization on the Environment: A Case of Moshi Municipality, Tanzania. *Tanzania Journal of Population Studies and Development*. 8 (1 & 2), 2001.
- Kauzeni, A.S. 1995. *A Paradigm for Community Wildlife Management: The Case of Protected Areas of the Serengeti Region Ecosystem*. Institute of Resource Assessment, University of Dar es Salaam.
- Kinshaga, D.Y. 2000. *A Research for Change- Agents' Centred Interdisciplinary Curriculum Based on Dialogical Approach*. A Paper Presented in the Open University of Tanzania staff seminars.
- Majani, B. 2000. *Institutionalizing Environmental Planning and Management in Dar es Salaam*. Ph.D. Thesis. Dortmund University.
- . 1994. *Towards a More Effective Approach to Urban Governance in Tanzania: The Case of Dar es Salaam City Council*. Proceedings of a Workshop on Institutional Building for Increased Public Sector Productivity: A search for Strategies of Strengthening Tanzania's Urban Management Machinery in Terms of Finance, Governance and Management, Goeth Institute, Dar es Salaam.
- Morogoro Municipal Records. 1995. *Municipal Government Documents*.
- National Bureau of Statistics. 2002. *Population and Housing Census General Report*. Dar es Salaam: Government Printer.
- Nyerere, J. K. 1974. *Man and Development*. Dar es Salaam: Oxford University Press.
- Otieno, J.N., G.C. Kajembe, & R.E. Malimbwi. 2001. The Contribution of Herbal Medicine to the Welfare of Local Communities: A Case Study of Babati District, Arusha, Tanzania. *Tanzanian Journal of Population Studies and Development*, Vol. 8, Nos. 1 & 2.
- United States Environmental Protection Agency (EPA). 2002. *Consumer Handbook Reducing Solid Waste: Compost Yard Trimming and some Food Scrap*. New York.
- World Resource. 1988/89. *An Assessment of the Resource Base that Supports the Global Economy with Data for 146 Countries*. A Report by the World Resources Institute and the International Institute for Environment and Development in collaboration with The United Nations Environment Programme. New York.