

**FACTORS AFFECTING COLLECTION OF AND WILLINGNESS TO
PAY FOR SOLID WASTE: A CASE OF ILALA MUNICIPALITY,
DAR -ES -SALAAM.**

By

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**A dissertation Submitted in partial Fulfillment of the Requirements for the Degree of
Master of Arts in Health Policy and Management**

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July, 2009**

CERTIFICATION

I, undersigned certify that I have read and hereby recommend for examination of dissertation entitled *Factors Affecting Collection and Willingness to Pay for Solid Waste Management Services; A Case of Ilala Municipality*, in fulfillment of the requirements for the degree of Master of Health Policy and Management of Muhimbili University of Health and Allied Sciences.



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DEDICATION

This work is dedicated to my daughter Neema and for memory of my beloved young brother, Emmanuel Madyo.

ABSTRACT

BACKGROUND: Collection of solid waste from households has been a problem for urban centres in developing countries. Households and providers of wastes collection services have greatly contributed to the problem of increasing uncollected waste. But, factors that drive households' contribution to collection services have rarely been explored in Tanzania, especially in low income communities.

OBJECTIVES: The overall objective of this study was to identify factors that affect solid waste collection and determine willingness to pay for solid waste management services in Ilala Municipality.

METHODOLOGY: A exploratory cross sectional study was conducted in Ilala Municipality of Dar es Salaam City. A total of 121 households (service recipients) from three wards of low socio-economic status were selected for the study. A semi structured questionnaire and checklists were used to collect information on households and providers variables respectively. A logit model was used to analyse factors affecting willingness to Pay.

RESULTS: The result reveal that age, sex, location, family size, fee charged and payment mechanism were statistically significant determinants of willingness to pay for solid waste collection services. Mode of payment for services and type of service provider affects solid waste collection services in study areas. The results further reveal that the mean amount spent by households on waste collection service was Tzs 1067 per month, while the mean willingness to pay was Tzs, 1,198.34 a little bit higher compared with the amount set by Ilala bylaw of Tzs 1000. About 95.8% of respondents were of the opinion that they needed solid waste collection services and 76% thought that present service providers should continue to provide the services so in their areas. CBO services were the most preferable mode of organization for solid waste collection services.

CONCLUSION: Households attributes and mode of organization of service providers significantly affect solid waste collection in Ilala Municipality.

RECOMMENDATIONS: Authorities should explore and make use of household characteristics when planning for Solid Waste Management schemes. CBO structures should be encouraged in solid waste collection services particularly in areas of low social

economic status. Appropriate payment methods should be explored and adopted to facilitate contribution to services by households.

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LIST OF ABBREVIATIONS

CBOs	Community Based Organisations
MHPM	Masters of Arts in Health Policy and Management
MOH	Ministry of Health
MSWC	Municipal Solid Waste Coordinator
SDP	Sustainable Development Programme
SWM	Solid Waste Management
WHOs	Ward Health Officers
WTP	Willingness to Pay

DEFINITION OF TERMS

Solid waste

Solid waste is defined as non-liquid materials arising from domestic, street, commercial, industrial and agricultural activities, also solid waste can be arise from construction and demolition activities, garden trimming and mining operations. Others are dead animals and abandoned cars scraps, this term is used interchangeably to mean refuse or garbage (MOH, 2003)

Municipal solid waste

Is the waste which municipal authorities are often responsible for collection and disposing it.

Solid waste management

Solid waste management refers to collection transfer, transport, processing, recovery and disposal of waste generated in cities. This service is essentially provided to protect public health, promote hygiene, recover materials avoid waste reduce waste quantities decrease emission and spread of disease.

Willingness to pay

The maximum amount that a household is willing to pay voluntarily for solid waste collection services rather than do without these services.

Affordability to pay

Is how much people can afford to pay for Solid Waste collection services.

Franchising contract

In this method the user pays the provider directly for the service and public authority may or may not control prices or services levels. May be exclusive or non exclusive.

Contracting contact

Public authority retains ownership but awards a competitive bid to a private vendor for the operation and maintenances.

CBOs

Community Based Organisation, are informal institutions that are formed by number of the community to address a need such as Solid waste management Operations.

CHAPTER ONE

1. INTRODUCTION

1.1 Background

Solid waste are the materials which is not in liquid form and have no value to the person who is responsible for it (Zurbrugg, 2003), whereas Municipal solid waste, refers to solid waste from houses, streets, public places, shops, office and hospital which are very often the responsibility of local governments

Providing Solid Waste Management (SWM) services is a big challenge in developing countries (Kaseva et al, 2002). Solid Waste Management problems arises due to increase in economic activities, changing of life style such as consumption of takeaway foods and drinking bottled water (Mighua et al, 2009); and also increase in natural population growth, exacerbated with movement of people from rural to urban. Furthermore, city authorities are unable to provide efficiency removal and disposal services due to budget constraints (Moghadan et al, 2009). Dar es Salaam City generates about 2600 tonnes of solid waste per a day but only about 40% to 45% of the amount generated is collected and disposed off. The remaining uncollected waste is haphazardly disposed in open spaces, closed and open drains, and burnt or buried in the ground.(Dar es Salaam City Profile, 2004),

The improper disposal of solid waste may results in outbreak of diseases, especially during rainy seasons. These diseases may result from piles of refuse which serve as food and breeding grounds for vectors of disease. Solid waste blocks water and open drains and during heavy rain the blocked drain may further result in serious flooding. Also, improper dumping of waste result into contamination of ground water as leachate from crude dumping find its way to ground water, consequently affects most poor people leaving in squatters and poor urban areas; as most of these residents their source of water is shallow wells which are easily contaminated by leachate. Municipal councils are struggling to collect and dispose solid waste to minimize these effects

Solid Waste Management is referred to as all activities pertaining to the control, collection, transporting, processing and disposal in accordance with the best principles of

public health, economics, engineering, conservation, aesthetical and other environmental consideration (Salaquzzaman, 2001). Its scope includes all administrative, financial, legal, planning and engineering functions. In order to provide proper solid waste management services, a lot of activities should be integrated together to obtain proper solid waste (Halla and Majani, 1999). Dar es salaam city introduced privatization of solid waste collection services in 1994. However, privatization has not been the panacea to the problem of solid waste management. Most of the private providers contracted dropped out. The providers could not recover their running costs as most of city residents did not want to participate and also pay for the service (Ayoub, 2008, Bilal and Nguvu 2004).

This study therefore is exploring factors contributing to low solid waste collection in Dar es Salaam City. These factors include households' characteristics, service provider's characteristics and functioning of local authorities.

The dissertation is arranged as follows: Chapter one introduces the subject and identifies the problem, Chapter two explores the literature of the subject, chapter three describes the methodology adopted to conduct the study. Chapter four presents the result, Chapter five discusses the results and the conclusion and recommendation are presented in chapter six.

1.2 Statement of problem

Solid waste generation is continuously increasing in urban areas in many developing countries due to expansion of development activities and population growth which is accelerated by rural urban migration (Kaseva and Mbuligwe, 1996). Additionally changing in life style has changed the quantity and characteristics of the municipal solid waste for instance consumption of takeaways food and bottled water (Mighua, 2009). Furthermore, the increase of using plastic bags has also contribute to rapid increases in waste disposed. Waste management accounts for about 30-50% of the municipal operational budgets of many cities (Merino, 2003). This increase in solid waste generation has increased the challenges of waste collected which are exacerbated by the resource constraints in municipal authorities.

Basically local governments are responsible for solid waste collection, but due to resource constraints facing these governments, many, private companies have been invited to

provide the service, to fill the gap. In Dar es Salaam City, private companies started participating in solid waste collection and disposal in 1994 (Kassim and Ali, 2003). Initially, the private providers were contracted to work in the city centre which has relatively rich people who could afford to pay for the services live. Later, the private providers were invited to provide the services in other parts of the city (Merino, 2003).

Private providers' participation improved the solid waste collection. By 2003 about 36% of total waste generated was collected (Kassim and Ali 2003, Merino 2003). However, the private sector had been only effective in few areas which received the service; most part of city waste disposal has remained unsafe.

Even with the participation of the private sector in assisting solid waste collection, the poor solid waste collection in Dar es Salaam city still affects the residential quality of life as well as the general environmental quality of the city. Rubbish blocks storm water drains and during heavy rains, results into the blocked drains in many places of the city. During the rain seasons there could be flooding. These have contributing the outbreak of cholera, malaria and diarrhoea diseases in different parts of the city. Also improper dumping of waste result into contamination of ground water as leachate from crude dump sites find its way to ground water, thus affects most poor people leaving in squatters and poor areas in the city. Most of these residents obtain water from shallow wells which are easily contaminated by leachate. Furthermore, people bury or burnt wastes which contribute to air pollution and have impact on visibility hence disturb the aesthetic condition of the city.

Currently, solid waste collection in most parts of the Dar es Salaam city is done by franchising methods, where the beneficiary households are charged for the waste collection. Despite this arrangement, this involves mainly the private sector. The piles of waste and poor disposal observed in most places of the city confirms that providers have not managed to collect all waste generated from households. The large increase in generation of solid waste, against low capacity of the private companies to collect the waste, coupled with poor response from households to promptly pay service fees. Exaggerates the problem of SWM in the city, and also overwhelming the capacity of the private sector. Furthermore, some households have not accepted the mechanism and therefore are not ready to pay for the service. (Ayoub, 2008).

Apart from refusal to pay by households, contracted companies also encounter other problems. These include perception of households that waste collection and disposal is the responsibility of the local authorities, and therefore the service should be provided for free. While others think that taxes collected should be used for the collection of waste (Majani, 2000). Unfortunately even, households that have accepted to the participation of the private providers in waste collection services are reported not to promptly pay for the services that they are receiving. These factors and other organizational problems have resulted into companies dropping out of the contract, and who remaining in service fail to operate efficiently. (Othman, 2002). For instance, in Temeke Municipality, by July 2005, a total of 12 companies were contracted to work in 12 wards for three years, however by the end of 2006 only two contractors were providing services exclusively in business and industrial areas. (Ayoub, 2008)

The consequence of dropping out of the companies from providing waste collection services has embittered the waste collection problem in the municipal;large part of municipality has no official solid waste collection services. Households' waste is either taken by individual themselves and dumped in open spaces or collected by group of people or unregistered community based organizations. Which finally they dump waste at the primary collection point hence increase cost for municipalities to take to final disposal point (Ayoub, 2008).

A number of approaches to encourage households to participate and pay fees to private providers have been employed. These include environmental awareness campaigns to the public through mass media, public meetings, and legal action against defaulters (Bilal and Nguvu, 2004). Despite these efforts households have not pay outstanding fees, resulting into worsening the waste management activity. Studies have not done in Dar es Salaam to explore why the served populations are not cooperating with the private providers in solid waste collection in Dar es Salaam city. Solid waste collection requires public participation so as to achieve equity in both financing and service provision. This study was intended to explore factors that contribute to low response on clients (service recipients), service provider's characteristics and local government authority which lead to low solid waste collection in Dar es Salaam city?

1.3 Justification for the study

The results of the study would help to identify factors that affect solid waste management in Dar es Salaam City. Since solid waste collection service needs community participation, the result will also help to design socially acceptable strategies to attain community participation in solid waste collection. Furthermore, the findings of this study will be shared with providers of the service, which will facilitate to design better ways of providing service. In addition to that the information would be useful to municipal authorities in setting priorities for solid waste collection in different parts of the city that would improve waste collection coverage and service efficiency.

Study results are also expected to stimulate further studies in the area of solid waste management within and outside of Dar es Salaam City particularly in community, private providers and public sector aspects for effective and sustainable solid waste management services. This study was also a requirement for completion of masters' degree in Health policy and management at the MUHAS.

1.4 Research questions

This study intends to answer the following main question:

What are the households, service providers and local government authority factors that contribute to low waste collection in Ilala Municipality?

This question will be divided into specific questions,

1. What factors influence households' willingness to pay for refuse collection services provided by private firms in Ilala Municipality?
2. What are the providers' characteristics that influence households' response to pay (or not to pay) for waste collection charges in Ilala Municipality?
3. What are the local authorities factors that affecting solid waste collection in Ilala Municipality?

1.5 Objective of the study

1.5.1 Broad objectives

The overall objective of this study is to explore factors contributing to low solid waste collection in three areas of Dar es Salaam.

1.5.2 Specific objectives

1. To explore available options for waste collection among households in Ilala Municipality.
2. To describe households' attitudes towards waste collection services in their areas.
3. To describe service providers characteristics influencing solid waste collection in Ilala Municipality.
4. To identify factors affecting households' willingness to pay for solid waste collection in Ilala Municipality.
5. To describe the role played by local government authorities in solid waste collection in Ilala Municipality.

1.6 Conceptual Frame Work

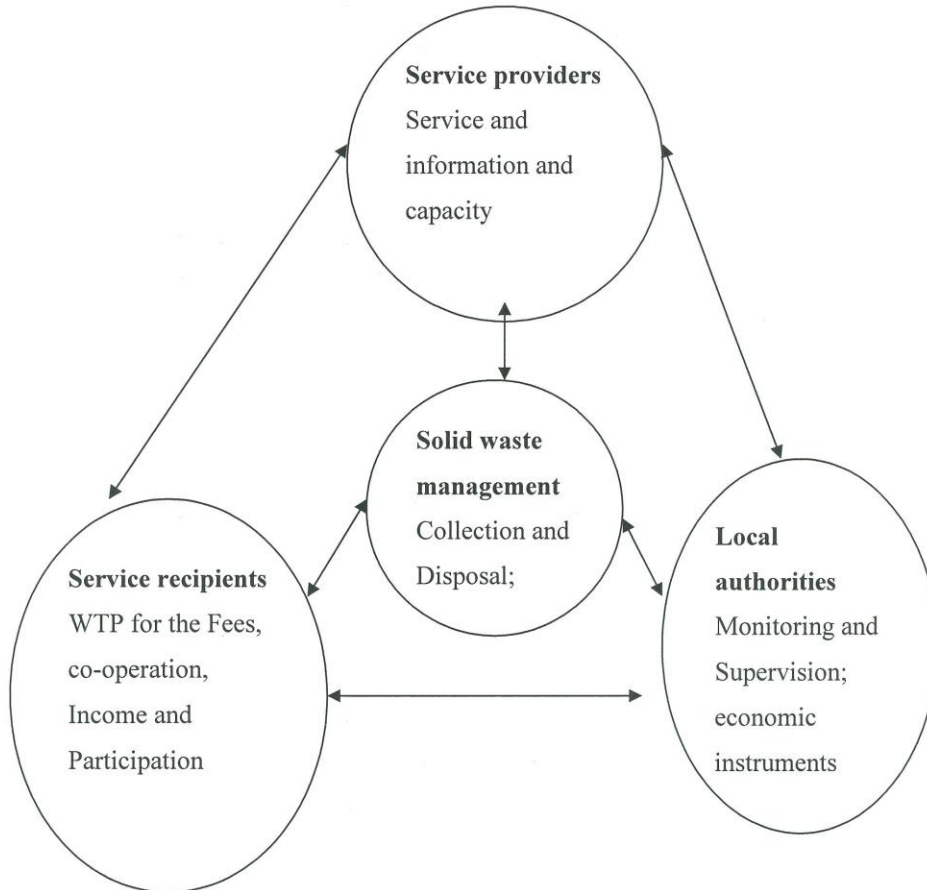


Figure1: Relation between Service recipient, service providers and local Authorities in solid waste collection.

Conceptual framework.

Following an introduction of user charges in solid waste collection by the government of Tanzania, it was expected that the problem of solid waste collection in Dar es Salaam city would be reduced significantly with improvement in service provision and community participation. Private service provider for solid collection in urban areas were expected to increase the amount of waste collected and disposed. The question remains whether the private providers involved will be able to provide service to the majority of people especially to the poor people who may not afford to cover the full cost of services provided.

Private providers find themselves confronted by the multitude of issues, which negatively affects their service performance, hence solid waste continue to be a problem. There are a number of factors that contribute to this. Households do not contribute as it was expected and hence private companies do not recover their costs which make them unable to provide the services. Also it can be argued that service providers do not provide services as the individual clients expected, may be due to low initial cost, inadequate facilities, low managerial capacity, inability of client to pay and or unaccepted vehicle used in collecting money.

Household willingness to pay is one of the factors which can affect solid waste collection; if there is more than one options, it can negatively affect solid waste collection because households can take their waste to informal group who collect waste on basis of negotiation on amount of money with the respect of amount of waste you want to be collected. Others take waste and dump into the streets, drains and gully. These options leave private company with little amount received from households hence cost recovery become very difficult and thus contribute to poor solid waste collection. Furthermore, most of the urban poor have budget constraints, demand for solid waste collection service will be one of the factor which will motivating them to pay and continue to pay, the demand for solid waste collection services will depend on the income of the head of households, number of the households, Education of the head of households.

Another crucial factor is the policy of using economic instrument of instituting user charges for solid waste collection was not well developed resulting in confusions among clients, households were accustomed to the free services provided by local authorities

when user charges started and if there was poor community involvement, this will have impact on solid waste collection, as people will not provide good participation, also when policy developed and over look that when solid waste is in the street, become public goods, households may opt for free ride hence not paying. Solid waste management services in many municipalities is not given high priority by policy makers compared with other services resulting getting very low budget which cannot be used to provide adequate service hence poor solid waste collection. This is because they are being more concerned with immediately problems such as hunger and diseases (Wolf, 2004).

Studies that explore the extent of solid waste management in Dar es Salaam city found that in each municipality solid waste management cannot be accomplished without integrating three main parts of the system. These include municipal authorities (public sector), private sector (service providers), and households (communities) (Kassim & Ali, 2003). Persistence of poor solid waste collection in Dar es Salaam city in spite of integration of three parties into the above framework call for attention to be given, to other factors which can contribute to low solid waste collection. The study therefore attempts to find households and private providers' factors that contribute to low solid waste collection in Dar es Salaam city.

CHAPTER TWO

2.0 LITERATURE RIVEW

2.1 Economic consumer theory on solid waste management

Microeconomic consumer theory on environmental goods or service postulate that, a consumer demand can be measured by the quantity of the environmental quality of service or goods consumed. The demand is influenced by prices faced, real income and a set of consumer characteristics. These consumer characteristics are proxies for his tastes and preferences and therefore have to be observed when a consumer is supposed to pay for the goods or services provided. The consumer is faced with a budget that defines the consumption possibilities, or the choice set. According to this theory, consumers choose combination of goods and services that best satisfies them and that they can afford to buy given the budget. The satisfaction is the utility they derives from the services. The consumer's goal is there to maximize utility given his budget constraint. (Mujinja, 2002;Carson and Mitchell,1989)

2.2 Global challenges for solid waste management services.

Over the last two decades, governments throughout the world have been confronted with increasing of solid waste management challenges, especially in part of collection and disposal (Zerbock, 2003, Reeve and Barrow, 2000) In early days disposal did not pose difficult as the habitation were sparse and land was plentiful, disposal become problematic with the rise of towns and cities where large number of people started to live together. Furthermore, Increase in economic activities increases the production of solid waste. Many efforts has been made to overcome this problem, one of the effort was to privatize solid waste collection, this can be observed in local authorities of England, Scotland and Wales whereby since 1998 have been compelled to put public service activities such as refuse collection out of tendering. (Reeves and Barrow, 2000). Also in local authorities of Ireland, for long time they used exclusive external sources for provision solid waste collection service, while in Holland and Australia, they have been encouraging to make use of competitive tendering and contracting as a means of organizing service delivery in solid

waste collection (Reeve and Barrow, 2000). For developed countries the magnitude of solid waste collection and disposal problem is not the same as in developing countries.

The problem is most acute in developing countries especially sub-Saharan Africa (Zerbock, 2003). The conventional municipal solid waste management approach based on collection and disposal has failed to provide efficient and effectiveness services to all residents. The urban environment steadily degraded due to waste management, which is not managed efficiently. One of the challenges they face is inability of municipal authorities to collection and disposal solid waste due to large increase of waste generation, which is a result of the rapid population growth and expansion of economic activities (Kassim and Ali 2003). In Nigeria the main challenges in solid waste collection are financing investments and how to maintain cost effectiveness of the operations (Oduro and Djik, 2008). This challenge facing Nigeria is equally or less the same to all developing countries.

2.3 Tanzania situation of solid waste management

Solid waste management is not efficiently done in Tanzania, in general and Dar es Salaam city in particular. Local authorities are not presently able to meet the continually growing demand for solid waste system due to burden of other problems facing them (Ayoub, 2008). The main reason of the situation is rapid population growth together with the expansion of the city, which increasing to the quantity of waste generated. In addition to that, there has been a big change in percentage of plastics in the waste stream during the last few years, mainly due to a change in the living style of the citizen; example consumption of bottled water and soft drink as well as fast food which have recently become popular have changed characteristics of the municipal solid waste during recent years (Mighua et al 2009). This increases the bulk of solid waste, and in the presence of technology used in this country management become difficult.

Private sector involvement in solid waste collection in Dar es Salaam City started in September 1994 and was been promoted by the Sustainable Dar es Salaam Programme (SDP) through its project of supporting the Dar es Salaam City Council as it foster new partnerships among public, private and the community (Kassim and Ali, 2003). Presently, 20 of 73 wards are covered with active companies. Until now it is estimated that about 40-

45% of waste generated in Dar es Salaam city is collected (Dar es Salaam City Profile, 2004).

2.4 Impact of solid waste collection on health

Solid waste management is the growing issue that has caused environmental problems especially in urban localities of developing countries. When solid waste is not collected unsanitary conditions poses environmental and human risks. Peace and Kerry (1994) According to Zurbrugg (2002), environmental degradation such as contaminating surface water can result when solid waste on ground come into contact with surface or when surface water come into contact with leachate. For instance Mhamba and Titu (2002) on their report, reported that, accumulated solid waste on the ground contaminate ground water which is the source of drinking water in many parts of Dar es Salaam city. Furthermore, air pollution can occur during burning of solid waste, also uncollected waste can decompose anaerobic ally and release methane. Prevalence of parasite, tetanus, malaria, hookworms, cholera and diarrhoea in most cities has been attributed with unsanitary conditions. In a report of House of the commons (2006-2007) show that there is evidence of increasing in population of flies, maggots, rats and other vermin caused by delaying collection of solids waste.

2.5 Public sector in solid waste collection

Most Governments of developing countries are supposed to provide basic services to its people. However economic crises which occurred in early 90's have resulted into cutting down budgets of public service and social service sectors. Services affected include management of solid waste in urban areas. Therefore, since then the budget constraint has remained a chronic problem, and exacerbated the resource allocation problem(Zurbrugg, 2003, Henry et al, 2005) argued that many municipal authorities tend to allocate their limited financial resources for solid waste collection to the richer areas of higher tax yields where citizens with more political power resides. Apart from resource constraints, institutional deficiencies (Glawe et al, 1999), are also exuberating to this problem. Most of the local authorities maintained inflated number of workers which exhaust most of the revenues in the form of wages leaving little to cover for other services (Coad, 2005). For

instance, Henry et al (2005) provided a typical example of institutional deficiencies faced by many urban local authorities, in Delhi, India, where by about 46,000 workers in solid waste management appeared in payrolls but 33,000 workers are available in the field. in the presence of small budget allocated to this service, the problem become unbearable (Zurbrugg 2003).Furthermore, Awortwi (2003) point out that there is no well defined performance target or standards for assessing performance of urban solid waste providers, hence one can ask how monitoring and supervision is being done by the local authorities to measure the performance of the private providers.

Studies show that many municipal authorities are ignorant of what has been costing them to provide a solid waste collection service, therefore they cannot judge if the bids from the private sector are reasonable, resulting in providing the contracts which are impractical to private providers(Zurbrugg, 2003, Glawe et al 1999 and Coad, 2005). Failure to the private sector to abide with the contracts results into inefficiency on solid waste collection and disposal.

Henry et al (2005) observed that politics, political parties also can interfere with solid waste management especially where the area has different parties ruling at different levels. The political effect has also been observed in Dare s salaam, Buguruni ward in Ilala Municipality. Politicians, who find out solid waste management service as an important instrument to retain patronage and popularity, may exert influence on solid waste management (Ahmed & Ali, 2003), such actions can impact negatively or positively in solid waste collection, depending on the direction of the action.

2.6 Private providers in solid waste management

Introducing private providers in solid waste collection in developing countries is based on the expectation that solid waste coverage will be increased and problem of improper solid waste disposal would be overcome, but the improvement have rarely been observed in Dar es salaam city, only about 40%-45% (Dar es Salaam, City Profile, 2004) is collected after privatization. In Ghana after privatization of solid waste introduced in three cities, Awortwi (2003), cited out that local government were found to be paying more than they used to when the services were delivered by the local government and indigenous contractor. For example, at a time of signing a contract with the private sector, the Local

Government of Accra was paying US\$22.00 for a ton of solid waste collected after contracting out local government was paying high price, 3 times for the same ton. Collusion and corruption by politician and some rent-seeking private associates were cited as the main cause of hiking the cost. On contrary a study done in Ireland by Reeve & Barrow, (2000) shows that after local authority contracting private providers in solid waste collection there was a cost saving on each ton of solid waste. Furthermore, when comparing Ireland to UK, solid waste collection in UK was found to be two times lower than in Ireland, this may be in developed countries they have more the advancing technology and good infrastructure compared to developing countries.

A number of explanations have been provided on why private provider face problem in recovering their capital cost, operational and maintenance costs. One factor which was pointed out by Oduro et al (2008) was poor response of service recipient in paying user charges especially in house to house collection. Household users' default in paying their services charges under the franchise arrangement and communal user do not pay for the service, this affect the private provider performance, Kassim and Ali,(2003) cited out that low willingness to pay and inability to pay caused by low incomes can be one of the cause. According to Ayoub (2008), Community don't agree and accept this arrangement that their waste should be handled by private companies, this makes them not to pay. Another factor is the poor cooperation from Local government, Oduro et al (2008) cited out that local authorities delay in payment for communal services rendered by the private companies, on top of that Medina (2002) pointed out that when it came for the defaulters to be taken to court, local government who are responsible provide no cooperation at all.

Thirdly to that, Moghadan et al (2009) and Diaz (2009) point out that financial constraints also affects private providers, inadequate private providers finances are reflected in the use of very old vehicle which breakdown frequently, and Jiang et al (2009) insisting that delaying of maintenances or repair, results in poor coverage and low quality services, since waste would not be collected when vehicles breakdown and cannot be substituted. Furthermore due to presence of limited resources, private providers, will be facing an option of providing service to areas which will benefit them, resulting excluding poor residents. The outcome of this is the accumulation of piles of waste in streets resulting to environment pollution and health hazards.

2.7 Community response in paying for solid waste collection

Co-operation from the residents is a vital aspect in managing solid waste collection of a city. Habits and altitude of inhabitants of the city largely affects waste management system therefore awareness and public participation is a major step in effectiveness of the solid waste management system. In the capital city of Nepal, the involvement of private sector door to door collection, street sweeping, garbage collection and solid waste transfer, has greatly improved the efficiency in solid waste management (Glawe et al, 1999). The increase has reduced the burden in municipal authority both in financial and human resources; one factor behind success is the participation of community in solid waste management. Sometimes community cannot have a chance to participate in solid waste collection because, most of the private providers prefer to provide solid waste collection services in areas where they can collect solid waste and collect user charges easily but unplanned and remote areas they tend to avoid(Oduro et al, 2008).

2.8 Solid waste management Policy

Solid waste management policy in many urban cities is instituted by privatization policy, Reeves and Barrow (2000), Awortwi (2003) cited out different methods of privatization, which includes, contracting, concession, franchising and open competition. Public choice theory indicates that it is using of the competition rather than awarding contracts to agent is the critical factor in lowering cost and improving efficiency, even where even number of suppliers in the market is small, government can still influence competition through regulative, facilitative and monitoring. However in many local authorities in developing cities they either fail to choose a method of privatization which is compatible to their area or they are having weakness in choosing private providers. Awortwi, (2003) point out that, weakness in choosing private providers was one of the cause of failing to collect waste in Accra and Kumasi as private providers were given absolute monopolistic powers to operate without any form of competition, this was not because there were no other competitive private providers but because of rent-seeking behaviour of some of some local bureaucratic and politicians.

In Dar es salaam city, house to house collection is done by franchising method where private providers collect waste and user charges from households, this method also have

some problems when it come in collection of user charges, service recipients are reluctant to pay user charges. Merino (2002) point out that, at the level of private providers only large companies have any real value to local authorities, whereas at user level private companies are only interested in minority of the population, that is the ones able to contribute in solid waste collection services, this can leave poor population without the service.

2.9 Laws of solid waste management

Laws governing municipal solid waste disposal and revenue collection are not enforced (Merino, 2003, Henry et al 2005). This can be observed in the analysis done in Ghana by Awortwi,(2005), although local authority did increase user charges in solid waste collection between 50%-150% in 2000, only 2% of the revenue was collected. This means there was insufficient and ineffectiveness in the method of revenue collection. This is worsened by the financial mismanagement which results in a persistent lack of funds to expand and improve municipal solid waste handling capacities as well as capacity building.

Apart from enforcement, Mahamba and Titus (2000), show that, local government bylaws are rigid and outdated, Example prohibiting people to actions such as throwing garbage on streets, such law and regulations are currently ineffective in containing such defaulters, first of all, laws are old, most of them were inherited from colonial government with no, or little amendment since then in colonial era. For instance in Dar es Salaam city, Tanzania the public law and regulations are now in process of amendments. Therefore the prescribed harsh punishment is currently just like jokes to the offenders, this is worse in Asian countries, Minghua et al (2009) found that in most of these countries regulations pertaining solid waste management have not been enacted or are in the process o of being drafted that means they have no means of regulating solid waste management activities. On top of that, Ogu (2000) cited out that enforcing of the rules and regulation are unmotivated due to low remuneration of civil servants in the most developing countries. Low remuneration motivate them to adopt perceived behaviours like corruption and rent seeking in some instances and or complete laxity in some others, this make laws ineffective and inefficiency.

2.10 Willingness to pay for solid waste collection

A rational consumer will, due to the constrained budget facing him, give preference to alternatives that give him higher utility. A good or service associated with highest WTP would be the one that yields high utility to the consumer. Subsequently, a high willingness and ability to pay indicates high utility derived from the commodity and hence such a good would be given preference, implying its high demand. Logically, a service that satisfies one most is also highly valued. The value of a service would be expressed through WTP for the service.

Individual's willingness to pay for solid waste collection is affected by many factors which include providers and community characteristics. Households may be willing to pay for waste collection services that takes their waste out of their immediate neighbourhood to dump it short distance away outside of sight however they may not be willing to pay for it to be taken outside the city to the official waste disposal site (Othman, 2002).

A study on WTP for community based solid management and its sustainability in Bangladesh, maintain that where a community perceives that new facilities provide a service higher than the existing management they would be more willing to pay higher contribution. This is particularly the case, if the users are not satisfied with the current service they are receiving (Salequzzaman et al, 2001). However, this argument is problematic because it assumes households have perfect information about the envisaged alternative sanitation methods for them to be compelled to make higher payments. Kassim and Ali,(2003) have found that in Dar es Salaam city, solid waste collection is low, and it is not well known of what are main households', private sectors' and public sectors' characteristics that negatively affects solid waste collection and disposal in the city. Different interventions has been carried out in Dar es salaam city however the solid waste collection is still low; 40%-45% of solid waste generated per day receive proper collection and disposal (City Profile for Dar es salaam City Profile, 2004)

CHAPTER THREE

3. METHOLOGY

3.1. Study site.

This study was conducted from May 5th to 5th June, 2009 in Ilala Municipality in Dar es salaam City; the main reason of conducting this study on Ilala Municipality was chosen because it was the district where most of private companies providing service had lost their contracts after failing to meet the targets required by local authority at the time of this study. It was also the time when the Municipal had decided to use Community based Organisations (CBOs) to provide the service.

3.2 Study design

A cross sectional explorative study was conducted using semi structured questionnaire with a mix of closed, open ended questions, and in - depth interview schedule.

3.3 Study population

i. Households

The study population were clients of solid waste collection services which included households from three areas of low socio- economic status, Buguruni, Vingunguti and Ukonga wards. According to the literature, low socio- economic areas have more waste collection problems compared to high income areas. Private companies tend to avoid providing services in these areas as a result; with a pretext that the companies will not able to recover their running costs and making profit.

ii. Providers

Providers of solid waste collection services involve public service as well as private firms and organizations (including CBOs) in the selected areas. One area was initially served by public and therefore Municipal Solid Waste Coordinator was interviewed.

3.4 Sample size and sampling procedures

Based on who was providing the waste collection services in this area, a total of 121 households were interviewed. Three wards in Ilala municipality were purposefully included in the sample these include Buguruni ward with public service provision, Vingunguti ward with private provider provision, and Ukonga ward with CBOs providing the service. Four urban streets were randomly selected from each ward. From each street, ten households were systematically selected in each ward by including every 5th house. In each house selected, one household was randomly selected for interview. A total of 40 houses were finally selected from in each ward. In each house one household was selected. In a household the head of the household, was interviewed, in his or her absence, an adult member of the household with knowledge of family affairs was interviewed.

3.4.1. Inclusion and exclusion criteria

All households in selected areas were included. However, household members where no adult member (18years or older) could be contacted were not interviewed in this study. The questionnaire was designed to collect information on socio-economic status of the household of the households, such information could best be provided by grown up persons with enough knowledge of family affairs.

3.5. Instruments

Data was collected using a semi- structured questionnaire with closed and open ended questions. The questionnaire was developed in English, translated to Kiswahili, then back translated to English. The Kiswahili version was used for interviewing households. An In-depth interview schedule was used to interview providers of solid waste collection services. The interview schedule was developed in English, translated in Kiswahili and administered in Kiswahili as well. The information collected included socio-demographic characteristics and information on attitudes and practices of the household on solid waste collection services, assessment of households on the services provided by private, CBOs and willingness to pay for solid waste collection.

3.6. Pre testing

Before the data collection process began, pre testing of instruments was done by the Research Assistants and the Principal Investigator. The pre testing of the questionnaire was done in 15 households in Kinondoni Municipality to check for accuracy, consistency, coherence and validity of questions. Thereafter, the questionnaire was revised by updating wording of wording. More questions were also added where essential information could not be captured in the first version. All changes were incorporated in the final version that was used in the actual data collection.

3.7. Data collection procedures

Data collection started after obtaining permission from relevant authorities i.e. the Ethical Clearance Committee, City and Municipal authorities. Before data collection process began, ward leaders were visited and explained on the purpose of the study. Ward leaders were asked to introduce the interviewers to street leaders who provided assistance in identifying the respondents. Eligible individuals were interviewed in their respective households after giving their consent to participate in the study. Interviews were conducted privately between the interviewer and the individual respondent. Responses were pre-coded numerical: ordinal or nominal data were coded at the end of data collection.

3.8. Study variables

In determining households' attitudes towards solid waste management services Households were asked to state how they felt about services rendered by private providers and some times rate their performance, households were also asked to name factors that affected solid waste collection in their areas. Accordingly the following independent variables were therefore explored;

Age of the respondent, education of the respondent, the family size, sex of the respondent, frequency of the collection, willingness to pay, equipment held by the providers, number



of households in one domicile, fee charged, type of organisation collecting waste, monthly expenditure, location of the respondent.

Dependent variables were;

Efficiency in service provision,

Level of community participation in waste collection services, and

Continued operation of service providers.



3.9 Data management and Analysis

Data management

During field work, the Principal Researcher supervised the Research Assistants in the field by inspecting all the data collected in a day on the same day. Errors detected were corrected immediately. Qualitative information collected after were transcribed, coded, classified and tabulated to adjusted or any missing information. Questionnaires were given serial numbers before the data were entered in the computer.

Data analysis

Data were entered using Epi Info. Version3 then transferred to and analyzed using Stata 10. Frequency tables were run followed by cross tabulations between different variables. To identify factors affecting willingness to pay of households a logit model was used. In logit model, first linear regression probit model was tested for pre investigation.

Study mode was specified as follows equation;

$$y = \alpha + \beta_i x_i + \epsilon_i \dots \dots \dots (1)$$

Whereby Y =1, if an individual is willing to pay and 0 if an individual is not willing to pay. X is a vector of independent variable to be used in a model, including socio- economic status of the individual and perception of households on solid waste collection service. We can rewrite equation (1) in more detail as

$$y = \alpha + \beta_1 sex_i + \beta_2 Edu_i + \beta_3 Age_i + \beta_4 month_i + \beta_5 size_i + \beta_6 marital_i + \beta_7 fee_i + \beta_8 loca_i + \beta_9 provider_i + \beta_{10} pay_i + \beta_{11} method_i + \epsilon_i$$



Where by

1=Sex, 2=Education, 3=Age, 4=Monthly expenditure, 5=Family size, 6=marital, 7=fee charged, 8=location, 9=type of provider, 10=paying mechanism, 11=method of storage
 α and β are Coefficient exponents, ε is a random error.

Write sex 1=female, 0= male

γ is a binary response, which cannot be modelled by Ordinary Least Squares (OLS) due to the following limitations; first a binary response lack constant Variance, an assumption which is required in Ordinary Least Square (OLS). Secondly, OLS may result into non sensible prediction. That is, it may give prediction which are not within the range of binary response variable (0, 1). Lastly, binary response is not normally distributed hence violates a key requirement for OLS. So we have adapted a logistic regression, by considering Logit

$\frac{P}{(1-p)} = \alpha + \beta x + \varepsilon$, where p is a probability of individual willingness to pay and (1-p) is the probability of not paying, then P is

$$P = \frac{e^{\alpha + \beta x}}{1 + e^{\alpha + \beta x + \varepsilon}}$$

In measuring **mean** and **median**, frequency distribution table was used

Table1: Definition of variables.

Variable	Description	Nature
Dependent		
WTP	Maximum Willingness to pay 1=yes, 0=no	Dummy
Independent		
Age	age of the respondent in years	Continuous
Sex	sex of respondent, 1=female, 0=male	Dummy
Marital status	marriage status, 0=married, 1=single	Dummy
Education	level of education reached by respondent 1=secondary school and above, 2=primary school 3=no education,	Dummy
Location	location of respondent, 1=Buguruni, 2=Vingunguti 3=Ukongga	Dummy
Monthly	Monthly expenditure	Continuous
Family size	Number of people in a household	Continuous
Fee charge	Fee charged for solid waste	Continuous
Provider	Type of provider, 1=public, 2=private company 3=Community Based organisation	Dummy
Payment mechanism	Mechanism for paying collection fees, 1=monthly, 2=per waste collected	Dummy
Storage method	having method of storage, 1=yes,0=no	Dummy

3.10. Ethical consideration

The proposal was processed through Muhimbili University of Health and Allied Sciences (MUHAS). The Ethical Clearance Committee provided the ethical clearance to conduct the study. Permission to conduct research was requested from relevant authorities; Municipal Executive Director of the Ilala municipality, Dar es Salaam before carrying out the study.

Individual respondent's consent to participate was sought after explaining the purpose of the study. Refuse to participate to the study was accepted. That means if a person refuses to participate, and a house has more than one household, another person from different household was replaced.

3.11. Limitations of the study

- a).The study site was purposefully chosen and hence result cannot be generalized to other areas in the country. However the households and respondents were randomly selected.
- b).Some people refused to participate in the study, which may further increase the selection bias. However, they were replaced by a household in the same house.
- c).Some of the respondents may have responded strategically. This was minimized by asking a follow up question to conform the value mentioned and reasons for the value chosen.

CHAPTER FOUR

4.0 RESULTS

This chapter reports the results obtained from the interviewed households and providers. We start with descriptive response and end with analytical result. Results are categorized according to objectives.

4.1 Socio-demographic characteristics of the study population

A total of 121 households from three wards were interviewed, (70%) of respondents were females. Majority of the respondents (79%) were married. Most of the respondents (49%) were aged between 35 and 55 years. Table 1, summarizes the socio-demographic characteristics of the sample interviewed. The Table 1 indicates that 54.5% of the respondents had primary education.

Most interviewed persons 75.5% were heads of households. About 84.47% of the interviewees had lived within the study areas for more than ten years. Majority, 80.99% of respondents 80.99% had plastic bag as a means of storing waste (Table 6).

4.2. Information on Providers Operations.

Methods of privatization provided to private providers.

Three groups of service providers were involved on the study: Public, Private company and CBOs. The In-depth interviews revealed three basic arrangements defined by local authorities for providers on refuse collection services in respective areas. First, direct contract through competitive tendering process: This contract obliged the provider to sweep main roads, adjacent drains and public places, collect and dispose waste at the final disposal point and is paid by the local authority. Second, the franchising contract; this was done in the communities (households), where private providers were engaged to collect waste and collection charges from households. These contracts were supposed to follow the laid down procedures and providers were supposed to provide services in accordance with terms in agreed contract. The last arrangement system was the local authority that provided solid waste collection services in major roads and secondary collection points in all areas that had no private provider. The local authority employed individual labourers for the job and sometimes exploited community initiatives.

Table 2: Social-Economic, Demographic Characteristics of Respondents (N = 12)

121 respondents	Buguruni(N=41)	Vingunguti (N=40)	Ukonga (N=40)
Age of respondents (in Years)			
Age group	frequency	frequency	frequency
18-35	30.23%	48.83%	20.93%
36-55	38.33%	20%	41.67%
56 above	22.22%	38.89%	38.89%
Sex			
Male	16.22%	40.54%	43.24%
Female	40.47%	29.76%	29.76%
Marital Status			
Married	27.08%	34.38%	38.54%
Single/Widowed	56%	28%	16%
Head of Households			
Male	23%	27%	21%
Female	6%%	5%	8%
Education status			
Above Secondary	14.29%	33.37%	52.38%
Primary education	35.12%	34.04%	30.85%
No education	66.66%	16.67%	16.67%
Occupation			
Employed	22.22%	44.44%	33.33%
Self employed	33.93%	32.14%	33.93%

Collection charges

A bylaw sets the amount of user charge households would be supposed to pay. However, the study found that in some areas companies charged as they wished. The collection depended on among other things on assessment on the volume of waste made by the provider. One provider confirmed this;

“We sometime increases amount of collection fees depending on amount of waste collected from a household”.

In other areas people refused to pay amount set by local authority and negotiated for the amount to be paid. The Private Company charges ranged from Tshs 1000 to 3000 per household per month, while CBOs charge Tsh 700 once per month, in some areas, CBOs charges between Tshs 200 and 600 per week. The charges also depended on the assessment by the providers, especially on the expected profit. The MSWC also affirmed this by saying that;“Increase in costs of services entails the producers to charge profitable fees.”

Providers’ human capital and Instruments

Private company had three technical staffs, employed on a part time basis. The company had 136 workers for collecting waste and collection charges from households. These were temporally employed on weekly basis. Also, the company had 8 vehicles with carrying capacity range from 2.5 to 8 tons; CBOs had 46 workers all employed on temporary basis, with no technical staff. (Table 2)

Table3: Providers Human Capital and Instruments

Variables	Public providers (n=1)	Private providers (n=1)	CBOs(n=1)
Number of workers			
Technical staffs	3	3	0
Other staffs	44	136	60
Total	47	139	60
Vehicles for solid waste collection			
≤2.5 tons	0	1	0
>3tons	0	3	0
8tons	10	4	0
Trailers	0	8	3
Tractors	0	3	1

Providers and Amount of solid waste collected

Currently, only 8 private providers were able to secure a contract, which means they met all criteria in bidding tender; as a result 14 wards had no private providers

Only 520 tons (48.59%) is collected per day.

opinion that their community needs solid waste management services. Regarding paying for collection charges about, 95% of respondents agree that paying collection charges is one of their responsibilities.

Table 5: Assessment of Importance of Households on Solid Waste Management Services

	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
Do you agree that it is important to have a way of storing waste temporarily at your home?	21.49%	70.2%	7.44%	0.83%	0%
Solid waste Management is a problem at your area	23.97%	31.4%	19.83%	19.1%	5.79%
Community needs solid waste collection services	13.3%	82.64%	2.48%	1.65%	0%
Uncollected waste can cause effect on Human and environment	23.93%	74.38%	1.65%	0%	0%
Paying collection charges a households' responsibility	20.66%	74.38%	3.31%	1.65%	0%

Odds ratio was further used to explore relationship between those who support needs of solid waste collection service in their community among male and female. The probability of women supporting that community need solid waste management services was 0.96, which mean, 77 of 80 women thought that their community needed solid waste management, while probability of men supporting that their community needed solid waste collection services was 0.95, which means 39 out of 41 men thought that their community needed the services. The odds of who support that community needs collection services is 23 (116/5), this means that there is 23 people who support the need for solid waste collection service for each person opposing it. (Table 5)

How solid waste is supervised and monitored

Private providers were supervised and monitored by Solid Waste Municipal Coordinator through the Ward Health Officer. The Health Officers were supposed to have checklists for monitoring solid waste collection services which they fill and sign daily. However, on contrary the study found that Ward Health Officers (WHOs) had no checklist. For WHOs to have filled the checklist, the provider had to provide one. For the direct contract, filled and signed checklists are taken to the Coordinator where payments for solid waste collection services for private providers are processed. For franchising contract, private providers, collect both waste and collection fees. The recording of amount they collect is done by providers, however there is no verification done. 4.3. Solid waste collection providers in respective Areas

Community Based Organization is the most common arrangement used for solid waste collection and disposal as reported in the study population, it was most found in Ukonga ward, Private provider was found in Vingunguti ward Public provider was providing service in Buguruni ward.(Table 3)

Table 4: Solid Waste Service Providers in Study Areas (n=121)

Variable	Location			
	Buguruni	Vingunguti	Ukonga	total
Provider				
Public provider	68%	8%	4%	20.66%
Private provider	7.14%	92.86%	0%	23.14%
CBOs	16.67%	10.42%	75%	48.76%
Arrange*	42.86%	35.71%	21.43%	11.57%
Myself	33.33%	33.33%	33.33%	4.96%
Total	33.05%	33.05%	33.88%	100%

*Arrange with people in community.

4.4. Households' assessment on solid waste collection Activities.

Respondents were asked their assessment and attitudes on the solid waste collection services provided in their areas. Table 4, shows that most of interviewed respondents had positive attitudes on solid waste management. About 95.87% of the respondents were of an

Table 6; Odds ratio between the need of solid waste collection services by Sex in the Community.(n=121)

Supporting the need of SWC	Male	Female	total
Yes	39	77	116
No	2	3	5
Total	41	80	121

Equipment used to for storing waste temporarily at home

The important equipment used for temporarily storage of solid waste at home was asked, most of the respondents 91.69%, thought that it was important to have means of storing waste; (Table 6).

Table 7; Equipment used for storing waste temporarily at home (n=121)

Equipments	frequency	Percentage (%)
Plastic bags	100	80.99%
Bucket	15	6.61%
Dustbin	2	1.65%
Others	4	10.74%
Total	121	100

**Others includes burial, place on the ground, throw in the gullies*

Responsibility of solid waste collection

On who should collect and disposes solid waste at their area, most of them (87.6%) thought that the waste they generate should be collected by the local government.

Table 8; Households opinion on responsibility for solid waste collection (121)

Area	Government	CBOs	Private	Total
Buguruni	95.1%	2.44%	2.44%	40
Vingunguti	80%	12.5%	7.5%	40
Ukonga	87.5%	7.5%	5%	41
Total	87.60%	7.4%	4.95%	100%

4.5. Households' assessment on Solid waste collection services done by private companies and community based organizations.

About 40.5% of the respondents were not able to assess the capability of the solid waste service providers' services and the company's sustainability in providing the service, for a long period. However, 76% of the respondents agreed that the providers operating in their area should continue providing the service (Table 9). The odds ratio was calculated to find out the relationship between the people who agree that their providers should continue providing service in their area and location. (Table 8) the probability of respondent who live in Buguruni and agree that the providers should continue providing service is 33/40 (0.76) the probability of living in Vingunguti and Ukonga and agreed is 69/81(0.85) The odds of those agree that the providers in their areas continue providing the service are 100/21 this mean that there 4.76 people supporting the idea for each person opposing it.

Table 9; Odds between location and acceptability of provider providing service (n=121)

Location	agree	Not agree	Total
Buguruni	31	9	40
Vingunguti & Ukonga	69	12	81
Total	100	21	121

Table 10; Households' assessment on Solid waste collection services provided by current providers. (n=121)

	Strongly agree	agree	neutral	disagree	Strongly disagree
Waste collection done by providers is sufficient to remove all waste	14.88%	50.41%	8.26%	20.66%	5.79%
Do you agree that the provider that collect waste in your area to continue collecting waste	6.61%	76.03%	7.44%	6.61%	3.31%
Do you agree that your waste should be collected by private providers	48.76%	20.60%	18.2%	10.74%	1.65%
Do you agree that the provider collect waste timely as supposed	5.79%	20.67%	22.3%	41.32%	9.92%
The provider that collecting waste is qualified to collect waste as expected	9.09%	25.62%	38.84%	24.79%	1.65%
The company collecting solid waste can provide the same quality of service for a long period of time	8.27%	21.49%	40.50%	24.79%	4.96%
The Provider collecting solid waste is capable of providing collection services for a long period of time	17.36%	20.66%	37.19%	22.31%	2.48%

*Likert scale (Strongly agree=5, Agree=4, Neutral=3 Strongly Disagree=2 and Disagree=1)

4.6. Factors that affecting households' willingness to pay in Ilala Municipality.

Household's WTP was assessed using the socio-economic characteristics;-age, sex, monthly income (as a proxy measure of income), Education, location and family size, the higher the age the less the WTP, the sex variable, represented by dummy (being a female). We assessed these factors because they are generally linked to income which is directly linked to WTP.

Table 11: Descriptive Statistics of the sample (n=121)

Variable	Obs	Mean	Std deviation	95%confidence interval	
Age	121	2.793388	0.6201	2.670611	2.916166
sex	121	1.661157	0.432077	1.57560	1.746705
Marital status	121	1.231405	0.0435358	1.145207	1.317603
Location	121	2.008264	0.746856	1.860392	2.156137
Monthly expenditure	121	9524.793	388.9143	8764.67	10284.92
Family size	121	6.92562	0.292744	6.346012	7.505228
Education	121	1.884298	0.442104	1.796764	1.971831
Fee charged	121	1067.355	63.96982	940.7095	1194.0001
Type of provider	121	2.041322	0.0755117	1.891814	2.19083
Payment mechanism	121	1.206612	0.03669598	1.133434	1.279785
House storage	121	0.446281	0.0453394	0.356433	0.5361289

4.6.1. Means and Median Willingness To Pay and household cost per month on solid waste collection services.

The mean of amount respondent spent for solid waste collection per month was Tsh1067, Median Tsh800, and Mode was Tsh700. The respondents WTP was slightly higher than the cost they incurred monthly in collecting solid wastes.

Table 12: Mean, Median and Mode of WTP and cost per month (Tsh)

Variable	Mean	Median	Mode
WTP	1198.34	1000	1000
Cost per month	1067.00	800	700

4.6.2 Linear regression Model

Linear regression was used to find relationship between independent and dependent variables. The linear regression assumes that the distribution is normal, variance is constant and the observations in the sample are independent. This model was run to find out relationship between variables and to determine fitness of the model since dependent variable was a binary response. The model was highly fitted (R square=0.43) Table 13; shows that, four variables Age ($p=0.016$), Sex ($p=0.002$), Family size ($p=0.002$), location ($p=0.005$) were highly statistically significant influencing WTP, and the rest of variables, Education, Marital status, Number of household in one domicile, fees charged, Producer providing services, monthly expenditure, method of storing waste are not statistically significant. This model is not appropriate one due to reasons mentioned before but it is presented for comparative purpose.

Table 13; Linear regression showing coefficients (n=121)

WTP	coefficient	Standard error	t-statistics	t> Z	(95% confidence interval)	
Age	-0.135064	0.567139	-2.44	0.016*	-0.2509115	-0.261014
Sex	-0.2810284	0.870178	-3.23	0.002*	0.4534943	0.1085619
Marital status	0.0085949	0.639665	0.13	0.893	0.1181847	0.1353744
Location	0.162086	0.567545	2.86	0.005*	0.049593	0.2745643
Monthly expenditure	0.0000152	0.871e-06	1.74	0.084**	-2.10e-06	0.0000324
Family size	-0.0391507	0.123295	-3.18	0.002*	-0.635874	-0.014714
Education	-0.075463	0.0667029	1.13	0.260	0.2076659	0.0567399
Fee charge	0.0000867	0.000589	1.47	0.144	-0.0003	0.0002035
Provider	-0.009711	0.696771	-0.14	0.889	0.1478088	0.1283869
Pay mechanism	-0.1125357	0.1055002	-1.07	0.288	0.3216336	0.965622
Storage	0.0899598	0.1548173	0.58	0.562	0.2168831	0.3968027

Prob>F=0.0000 *Significant at 5% **Significant at 10% R square=0.4267

4.6.3 Logit regression model

This is appropriate mode for the study, it was used to find out relationship between dependent and independent variables.

The coefficient of age is negative and significant (p=0.003). This indicates that as the age of the respondent increases, it reduces the logit of willingness to pay against not paying.

The likelihood of the respondent paying a given price for improved solid waste collection and disposal decreases as age of the respondent increases.

The coefficient of sex is negative and significant, ($p=0.009$) this indicate that being a female respondent female reduce the logit of willingness to pay. This implying that being a female respondent, the likelihood of paying decreases by 1.57628.

The coefficient location of respondent is positive and significant, ($p=0.001$). These results reveal that being an Ukonga residents increases the logit of willingness to pay by 1.365255

The coefficient of payment mechanism is negative and significant -2.732635 ($p=0.022$). This implies that a likelihood of respondent paying a given price for a improved solid waste collection and disposal decrease if the monthly payment would be used as the payment mechanisms.

The coefficient of household size is positive and significant ($p=0.000$). This implies that as the size of the family increases it reduces the logit of paying against not paying. This means likelihood of paying for solid waste collection services decrease as the size of family increases.

The coefficient of monthly expenditure is positive and significant, 0.0002271 ($p=0.000$) this implying that as the monthly expenditure of respondent as proxy of income increases it increase the logit of willingness to pay.

The coefficients of marital status is not statistically significant ($p=0.620$) fees charged ($p=0.064$) and method of storing waste ($p=0.889$), are negative and not statistically significant while coefficients of providers ($p=0.129$) and education ($p=0.050$) are positive and significant.

Table 14: logit regression showing coefficients (N=121).

WTP	Coefficient	Standard error	Z	P> Z	95%Confidence interval	
Age	-1.528703	0.5141626	-2.97	0.003*	-2.536443	-0.520963
Sex	-2.712111	0.7804756	-3.47	0.001*	-4.241815	-1.182407
Marital	0.2461114	0.4963353	0.50	0.620	-0.7266879	1.218911
Location	1.365255	0.4529523	3.01	0.003*	0.477485	2.253025
Monthly	0.0001085	0.0000741	1.46	0.142	-0.00368	0.0002537
Family size	-0.7326351	0.1868899	-3.92	0.000*	-1.098933	-0.3663376
Education	-0.7830518	0.5442014	2.44	0.050*	0.849667	0.2835634
Fee charge	0.0012881	0.0006948	1.85	0.064*	-0.1000737	0.00265
Provider	-1.02493	0.675466	-1.52	0.129	-2.34882	0.29899587
Pay mech	-2.709516	1.336423	-2.29	0.022*	-5.029633	-0.3893990
Storage	0.1865347	4.892511	0.14	0.889	-2.432805	2.8658875

Log likelihood=-42.293139

P=0.0000

LR chi2 (11)=80.76

Pseudo R2=0.4884

4.7. Problems and suggestion made by private providers.

4.7.1. Problems and related to solid waste collection reported by providers and their suggestion

Problem reported by private providers

The following were reported as problems that hinder efficiency of waste collection services in their respective contracted areas.

- Frequency of Traffic police arresting their solid waste collection vehicles
- Dumpsite located too far from their respective areas
- Household refusal to pay for solid waste collection services
- Households' haphazard throwing of waste in streets
- Private providers have no legal power to take default to court

Respondents also reported how they will overcome these problems.

The following are the suggestion reported by providers in order to provide quality and efficiency services.

- Planning of using of big cars with high capacity to decrease number of trips.
- Involving Ward officers in providing and collecting fees for solid waste collection services, and Summons of defaulters to court.
- Increase resources in terms of equipment and human resources.
- Increase of community awareness by using posters and health education.

They further made suggestions on how local government should deal with these problems.

- Using of direct contract, municipal authority paying private providers per tonnage collected.
- Fee should be increased because it is very low compared with running cost.

A number of problems related with SWM were reported by Municipal Solid Waste Coordinator; these included

- Lack of baseline data. Authorities do not know the exact number of households they serve, basically they rely on the data projected by the census done in 2002, as a result they do not know the exact amount of the cost pertaining running cost of this services.
- Lack of transparency between Private providers, Public providers and Communities.
- Business done during the evening (late evenings) was reported to generate a lot of waste but they do not pay for Solid Waste collection service.
- Rapid growth of the population in the municipality, this increase contributes greatly to generation of Solid Waste in municipality.
- Increase of vehicles in municipality roads; make movement of vehicles collecting solid waste difficult to pass through. Also they cause a long queue, which results in decrease in the number of trips that have to be made in and from respective areas.

CHAPTER FIVE:

5.0 DISCUSSION

The study explores households' attitudes and factors affecting willingness to pay for solid waste collection services in Ilala Municipality. It also looked at the operations of providers which affects solid waste collection.

In order for solid waste to be managed properly, different activities from each step of waste management should be done. Household Solid Waste Management (HSWM) starts from individual household, proper storage of waste, segregation, collection, transportation to final disposal area; All these are important steps in solid waste management. This study found out that only few of respondents had standardised dustbin, and majority had plastic bags as means of storing waste. The lack of standard equipment affects solid waste management services, plastic bags carry risks to solid waste collectors during collection, especially if the waste collected in these bags contain sharp objects. (Ajan, 2008). Also plastic bags that are not well attended could be easily destroyed by animals such as dogs and chickens resulting into littering of waste in streets. (Yusufu, 2007) Furthermore, it increases the time compared with standardised container therefore lowering efficiency (Zurbrugg, 2003). It has been found that containers should be corrosive resistant, with lids in order to facilitate collection (Mungai, 1998). These containers will exclude animals and trash blowing waste out of the streets.

The local government (Urban Authority) Act(1982) Section 55, gives the Urban Authorities the mandate "to remove refuse and fifth from public or private places and to provide and maintain public refuse containers for temporarily deposit and collection of waste, this is not abide by the providers of waste collection services in the study area.

This study found out that 95% of households agreed that one of their roles in solid waste management is to pay solid waste collection fees. Assessment on households on who should collect households wastes (provide the service), a significant proportion of 87.6% thought that their household waste should be collected by government. This implies that households are not much aware of their responsibilities on waste management. This is further reflected in resistance of paying user charges to private waste collectors.

Although households are not very much aware of their waste management responsibilities, they indicate that there is a potential demand for waste collection services. However the service providers do not meet the demand and efficiency is compromised due to lack competition among providers because they are few.

This study like other studies in poor areas, found that the most available option of solid waste management in low socio-economic areas is CBOs; Zerbrugg (2003) shows that CBOs are able to reach at all inconvenient areas where trucks can not easily reach. Awortwi (2005) reported that, CBOs are better in providing basic services such as solid waste collection in low socio-economic areas especially when members of organisation are also service users in the community. The study found that CBOs provide better service and community accept them compared to private companies. CBOs should therefore be subsidized by local authority since most of them would have low capacity to operate efficiently because of the lack of capital and equipment.

This study found that Willingness to Pay is affected by respondents' Age, education, household size, monthly expenditure; these factors were also reported by Yusufu et al (2007). Other factors include method of paying waste collection fees, type of providers and location of respondents.

Age of a respondent affects WTP; this may be due to the fact that as the age of respondent increases the level of income is likely to decrease. Furthermore, female respondents decrease the likelihood of willingness to paying. Women in most developing countries have low incomes and are therefore more likely to mention a low WTP.

Education also affects WTP due to the fact that, an educated person has a great chance of getting, not only a better job and earning more money but also having a better knowledge of health related issues compared to uneducated person (Yusuf et al, 2007). Also Family size affect WTP, most family members in this study were depending on one member of household, who reported low consumption expenditure. It is a fact that as the family size increases, more demand on meagre resources. And therefore a head with a large household size would be less willing to spend more on activities like waste management.

The capacity of the provider to satisfy the needs of the people has affect on WTP. In a situation where the services are poor, household would be less WTP.

A payment mechanism has been found to affect WTP for solid waste management. Paying per trip on waste collected is more preferred than monthly subscription especially to low income communities. (Coad, 2005)

Quality of the service provided influencing households WTP, in this study, households' assessment on quality of service provided greatly influenced WTP. Households spend on average of over one thousand shillings monthly. This Amount was relatively higher than has been set by bylaw. In low income societies in Tanzania, this amount is substantially high and households would be less willing to spend that a lot of money on solid waste collection considering that they have other competing needs.

One of important factor for the private company to provide efficient service is the ability of local authority to write and enforce a contract. Enforcement is affected if the authority has enough information on solid waste management in the areas. This study found that local authority do not know the real cost of providing SWCs in the respective areas, which means that it is not easy for them to implement the contract as a result hindering good performance.

According to public choice theory, the introduction of competition is one of critical factor of lowering costs and improving efficiency than of awarding contracts to few private providers. (Aworti, 2005) even if number of supplier in the market is very small. The authority has a role of influencing competition through regulative, facilitative and monitoring.

CHAPTER SIX

6.0 CONCLUSION AND RECOMMENDATION

6.1 Conclusion

Conclusions being made below are largely applied to the study area,

The demand of the solid waste collection services is very high compared to the supply of the service; most of the people are willing to pay at a slightly higher price compared to the price set by Municipal authority.

Method of paying Solid waste collection fees also play important role in Solid collection. Most of households in these study areas are not formally employed, they are self employed, in petty business with no guarantee of the monthly incomes.

CBOs are Ilala Municipals' choice as solid waste service providers for low socio-economic areas. These organisations are also largely accepted by communities because they are able to reach every individual in the community. However we also found that CBOs have no capital neither can transport waste to final disposal point.

6.2 Recommendations

Based on conclusions above the following recommendations are being made.

- Since the damp is settled more than 15 Km and most people of Dar es Salaam, (75%) city live in unplanned settlement, secondary collection point is needed to be constructed especially in inaccessible areas, this will help Community Based Organisation and private organizations to collect waste and hence facilitating disposal.
- Further research is need to explore Household perception on services provided by private companies, and on perception of local authority on services provided by private companies and CBOs in Ilala Municipality.
- For a municipal to provide sustainable services, municipal authority must look on criteria based on efficiency with regarding in control of collection charges, effectiveness, equity and provider capacity to deliver the service

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