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**WOMEN PARTICIPATION IN RESIDENTIAL SOLID WASTE MANAGEMENT: A
Case Study of Malindi Town, Kenya.**

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DECLARATION

This research project is my original work and to the best of my knowledge, it has not been presented to any university or institution for any award.

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DEDICATION

I dedicate this research project to my father Tirus N. Miringa.

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I wish to express my gratitude to all the people who worked to ensure that I complete this research project successfully.

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ACRONYMS & ABBREVIATIONS

AMREF	Africa Medical Research Foundation
CP	Community Participation
CBO	Community based organization
CEAPRED	Centre for Environmental Agricultural policy Research, Extension and Development
EPA	Environmental Protection Agency
EPHC	Expanded Primary Health care
FGD	Focus group discussion
G.o.K	Government of Kenya
JICA	Japanese International Cooperation Agency
KSH	Kenya shilling
KIPPRA	Kenya Institute for Public Policy Research and Analysis
KNC	Kenya National Census
MSE	Medium and small enterprises
MTGM	Malindi Green Town Movement
NEAP	National Environmental Action Plan
NEMA	National Environmental management agency
NCC	Nairobi city council
NGO	Non- governmental organization
RSWM	Residential solid waste management

SW	Solid waste management
SGH	Self help group
SWM	Solid waste management
UN	United Nations
UNDP	United Nations development program
UNEP	United Nations environmental program
UNHCS	United Nations Centre for Human Settlement
US	United States of America
WHO	World health organization

ABSTRACT

Urban solid waste menace in the developing countries has reached alarming proportions as the municipal authorities are always overwhelmed by the amount of waste generated each day. In most cultures of these countries, domestic chores which generate much of this solid waste are undertaken by women, and so they could be critical partners in solving this crisis. This study therefore sought to reveal the contribution of women in solid waste management both at the household and group levels in Malindi town, Kenya. The involvement of children in waste disposal by the women at the house level was also assessed.

The study was based on four specific objectives: to examine the characteristics of the women sampled, to assess the level of household solid waste management amongst women, to estimate the level of awareness on solid waste management amongst women and to assess the level of participation by women in solid waste management.

The research was anchored on two theories: Structural Functionalism and Habitus theory while adopting the descriptive research design where household survey targeting women was carried out. Focus group discussions were conducted and self-help group representatives provided information on women participation in the groups.

The study found out that, the majority of the women (48.4%) were in the age of between 30 -39 years and 60.3% reported to be married. The findings showed that most of the women residents interviewed (67.8%) earned less than Ksh. 5,000 per month and 56.7% lived in single rented houses. It was also established that 87.9% of the women interviewed were well aware of the dangers of pollution and diseases caused by poor waste disposal with 57.6% attributing this to the failure of the county government. At the household, it was established that 87.3% of the women sampled frequently involved children in waste disposal by tasking them to take waste to the bins. The study also found out that there were self-help groups that engaged in solid waste management in the town though they were ill equipped and lacked proper training to offer effective services.

In conclusion, it was clear that the county government of Malindi was constrained in offering solid waste services adequately warranting community participation towards this end. There is potential in the women co-operation in solid waste management in the town as they were of an active age that could participate in community work. Furthermore due to their low incomes, they would be willing to work in the existing self help groups to earn some money. Efforts ought to be made to encourage formation of more groups and fund the existing ones to counter the waste menace through this partnership. Women require to be equipped with modern skills on solid waste management which they would in turn pass over to their children whom they often involved in waste disposal. Households also need to be enlightened on solid waste management best practices such as recycling, reusing and composting in order to reduce waste at the source.

CHAPTER ONE: INTRODUCTION

1.1 Background to the Study

‘Hygiene is dignity’ (WHO, 1971). However, since the advent of the industrial revolution, the solid waste menace witnessed across the globe has continually denied humanity this noble pride. The World Health Organization report states that at the end of the 19th century the industrial revolution saw the rise of the world of consumer due to increase in population through urbanization, which was largely responsible for the increase in solid waste generated.

As the consumer appetite grew during the industrial revolution, and so did the waste generation in the urban areas. Industrialization in Europe had led to the creation of the factory system that contributed to urbanization with a large number of workers coming to the cities in search of work. This mass exodus from the rural areas caused overcrowding, as it was simply impossible to build homes for people as fast as they moved in. The developing countries never witnessed the industrial revolution but its effects continue to affect every sphere of life in these countries to date. For instance, due to urbanization, the municipal authorities are financially constrained to offer the SWM services adequately to the fast mushrooming settlements.

Today, the population continues on a trajectory growth path especially in the cities and towns of these least developed countries further stretching the capabilities of the municipal authorities to the limit. This unfolding scenario is posing a major challenge on the environment with effective management of solid waste generated being of utmost concern. United Nations commission on sustainable development (1999) states that cities are currently absorbing two thirds of the total population increase throughout the developing countries. The World Bank Report (2012) observes that urbanization is increasing all over the planet and increasing with it is the byproduct of urban living, *urban solid waste*. The report also notes that cities are centres of garbage production in many developing countries terming it an environmental catastrophe.

There are different methods of solid waste disposal in the world depending mostly on the development level of individual countries. The more complex and capital intensive methods such as incineration and sanitary landfill are more common in the developed countries. While in the least developed countries, dumping in open spaces is the order of the day since it is cheaper despite the environmental consequences (Zanjan et al, 2012). United Nations Environmental

Program (2004) states that methods for final solid waste treatment and disposal in developing South Asian countries were commonly open dumping, landfill and others.

Solid waste poses many challenges in the developing countries today due to poor disposal methods. The sight of dumpsites dotting the outskirts of the urban cities has become commonplace, coupled with the health and environmental hazards especially to the people living in the vicinity. Ngayenet al., (2011), notes that many cities in the developing countries face serious environmental degradation and health risks due to weakly developed solid waste management systems.

Its worth to note that much of the solid waste produced in the residential areas is household waste, sometimes accounting for over 50% of the total residential solid waste. Japanese International Cooperation Agency (1998) indicates that food waste account for 51.5% , paper 7.3% and plastic containers and others 11.8% amounting to 70.6% of all the residential waste. Benneh et al., (1993) also observed that residential domestic waste forms the bulk of solid waste produced in urban areas. Household waste composition is mainly organic in nature and could be a crucial starting point to achieve sound SWM through recovery. Women being the main actors in these entities could offer the much-needed support in providing SWM services in the residential neighborhoods and trading centres. For example, by composting household waste, much of the SW generated at this level can be put to use where Self-help groups could be mobilized towards this end.

At the household level, various methods of SWM could be employed to reduce solid waste which include compositing, recycling and re-use of dry waste. Composting would be the most appropriate way of disposing residential solid waste in the developing countries due to the high content of organic materials in its composition. This exercise is more successful if undertaken by individual households owing to the segregation aspect that is more effective at the source (household). There is a potential for energy generation from composting as witnessed in Asia where organic components are turned to energy. Zerbock, (2003) notes that composting in most developing countries occurs at the household level rather than at the municipal level e.g. in Dhaka, Bangladesh it was more successful in small-scale plants than in large scale. Singh (2010) states that India, Philippines and Thailand have converted waste to energy.

In Kenya, the problem of solid waste disposal is quite pronounced since much of the waste that is produced goes unattended. JICA (1998) estimates that only 25% of a total of 1500 tons of solid waste generated daily in Nairobi get collected. This is a frightening statistic, which replicates across the country. United Nations Habitat (1994), observes that like many cities in the developing countries Nairobi is producing solid waste at a rate, which outpaces the capacity of the county government to collect and dispose.

There is potential through recycling and re use of household solid waste where organized women groups could earn a living if they were empowered towards this end. Mwakumanya (2010), states that the coastal town of Kilifi is only able to collect 3 tons of waste everyday against 6 tons of waste generated, with much of the uncollected waste originating from the household. He acknowledges that there is a great opportunity for employment creation in this sector through Community Based Organizations and other local organizations which would generate income from recycling and composting.

The study also emphasizes on the role of children in SWM which have largely been neglected. Children could be trained from an earlier age to take care of their environment through formal and in informal education. According to National Habitat II committee in Kathmandu, Nepal (1996), '*Improving Environment through Best Practices*' educating, orienting and involving children in environmental programs was considered paramount.

1.2 Problem Statement

The household generates the largest amount of solid waste representing 85.15% of the total solid waste generated in Kilifi town. This solid waste is mainly the biodegradable waste which far outreaches the rate of collection with an estimated 840 tones uncollected every year. Concerted effort is required by the municipal authority, CBOS, community and the private sector to invest in solid waste management to provide a habitable environment, alleviate poverty and improve the livelihoods of the people of Kilifi (Mwakumanya, 2010). Mbuyi (1995) in his study on the role of community participation in residential solid waste management observes that: 'there is need to encourage and strengthen the neighbourhood cleanup operations in the residential areas as these operations reduce the waste menace'.

Despite the prevalent problem of household solid waste disposal in the residential areas, little has been done to analyze the role of women in SWM. Women have been identified as active actors in household solid waste generation, and as such would be prudent to assess their contribution in this endeavour. According to Douglass (1992) the bulk of household waste is generated from domestic chores performed by women. Unfortunately, little has been done to mainstream them in residential solid waste management especially in the developing countries. On the other hand, there has been no deliberate attempt to study women's' activities at the household level with respect to residential solid waste generation and management at the source.

From the above statements, the role of the community in solid waste management is acknowledged generally without emphasizing the role of individual actors especially women in this undertaking. Various studies have shown how SWM can offer employment for the community groups willing to collaborate with the authorities without underscoring the role that women can play being key stakeholders in service provision.

In many cultures, women are responsible for keeping the home and its immediate environment clean, so disposal of waste is one of their daily tasks. Furthermore, women are the first and foremost users of urban services such as water supply, sanitation , waste collection a role that makes them ideal beneficiaries of SWM projects. Aunshitx (1996) points out that women cooperation is essential for long-term success in any project concerning urban services He further states that they may not be interested in solid waste projects as a service but its employment and income-generating aspect may interest them.

Although a lot has been done to recognize the contribution of various community groups to SWM programs in the urban areas, the co-operation and potential of women driving this agenda have not been assessed.

1.3 Research Questions

The research questions that the research sought to answer were:

- i) What are the characteristics of the women sampled?
- ii) What is the level of household solid waste management amongst women?
- iii) What is the level of awareness on solid waste management amongst women?
- iv) What is the level of participation by women in solid waste mangement?

1.4. Research Objectives

Research objectives describe what the study expects to achieve. They are simply the measures that the researcher is going to take to answer the research questions.

1.4.1 The general Objective

The general or broad objective of the study was to examine the contribution of women in Solid Waste Management amongst women in the urban areas.

1.4.2 The Specific Objectives

The specific objectives of the research were:

- i) To analyze the characteristics of the women sampled.
- ii) To assess the level of household solid waste management amongst women.
- iii) To examine the level of awareness on solid waste management amongst women.
- iv) To assess the level of participation by women in solid waste management.

1.5 Justification of the Study

Among all different parts of the world, coastal areas are the ones commonly visited by tourists and as such SW volumes from activities in the coastal urban areas soar. For instance, the streets and residential areas of Malindi town are littered with garbage a horrible eyesore to all who visit this little town warranting a remedy to this sorry state. While the tourism sector in the coast is at its lowest ebb due to terror threats in the region it is worthwhile to curb the solid waste menace in Malindi as other efforts to market this destination are pursued.

Through community participation, women can find a niche in SWM through the existing female oriented CBOs with the emerging funds and financial institutions targeting women. Also, Community Participation approach is appropriate with women whose ability to cluster in economic groups is undisputed. Besides, the role of women in solid waste generation and management has remained largely uninvestigated. With the advent of devolution, there is need for a shift in paradigm now that power and resources are closer to the people who must be in the forefront in decision-making. The *nyumba-kumi* initiative for example could provide a platform for community mobilization not only for security but to solve other ills inflicting the society e.g. the solid waste problem.

Finally, the launch of the laptops for primary school children will come in handy in creating synergies with communities with the technology readily available to solve social issues.

1.6 Scope and Limitation

The researcher intended to explore the contribution that women in Malindi make towards solid waste management in the town. The study was only limited to the women participation in SWM at the household and in the self-help groups that undertake solid waste management. Those sampled were mature female residents who played a central role in the household; cooking, washing utensils, cleaning the house, looking after the children and other such chores. For example, in family consisting of a husband, wife, children and a house maid, only the maid would be sampled as she would provide better responses than the wife who relies more on the girl to perform chores. Elderly women who were dependent on house helps for such duties as mentioned were not sampled as their responses would not meet the requirements of the research.

The women of interest also provided the information on children involvement in SWM at the household while the SHG representatives were interviewed concerning women participation in SHGs without surveying individual members. In this case male and the children opinions were not considered. The study could not cover the entire town and only concentrated on the low income estates of Maweni, Kibokoni and Kisumu Ndogo.

1.7 Definition of key terms

- **Community participation:** refers to the people's involvement in the identification of their felt needs, mobilization of their resources, influencing direction and execution of environmental programs and projects (National Environmental Action Plan ,1994).
- **Disposal:** refers to the final handling of waste following collection, processing, incineration or placing in a dumpsite or landfill.
- **Hazardous waste:** refers to waste that requires special care because of poisonous (hazardous) components e.g. slaughterhouse waste with chemicals.

- **Household:** refers to the totality of persons living together in a residence and includes the household head, spouse, children, any dependents and servants living with them sharing common cooking arrangements.
- **Informal waste pickers:** refers to private waste pickers normally small scale, labour intensive largely unregulated and unregistered.
- **Solid waste:** refers to any solid material that has no values to the person responsible for it and it is not intended to discharge through a pipe. It is generated by domestic, commercial industrial, health- care and agricultural activities.
- **Solid waste management:** refers to the development and operation of refuse handling in a healthy, economic and environmentally friendly manner (Majani 1991). Mbuyi (1995) referred to solid waste management as the purposeful, systematic control of the generation, storage, collection, transportation, separation and disposal of municipal waste.
- **Stakeholders:** refers to any person, group or organization that can place a claim on an organization's attention, resources, and output or is affected by that output (United Nations Centre for Human Settlement, 1997).
- **Waste:** refers to any matter whether liquid, solid, gaseous or radioactive, which is discharged, emitted or deposited in the environment in such volume, composition or manner likely to cause alteration of the environment (Environmental Act of 1999).

CHAPTER TWO: LITERATURE REVIEW AND THEORETICAL FRAMEWORK

2.1 Introduction

Ali, (1997*b*) states that waste is a resource in the wrong place. Something can become waste when it is no longer useful to the owner, or it is used and fails to fulfill its purpose (Gourlay, 1992). Waste may take many forms depending on its source. According to Cointrean (1992) solid waste are the organic and inorganic waste materials, produced by households, commercial institutions and industrial activities that have lost their value in the eye of the first owner.

Urbanization and population growth have largely contributed to the challenges of residential solid waste management. A report by the World Bank (2012) showed that the amount of SW is growing even faster than the rate of urbanization globally, as urban residents on average begin to consume more and therefore generate more waste. The municipal authorities in the developing countries do not have the capacity to offer adequate SWM services leaving large volumes of residential SW unattended. According to United Nations Centre for Human S (1998), only between 25% and 55% of all waste generated in large cities is collected by municipal authorities.

Poor solid waste disposal causes diseases and even deaths to many around the world due to pollution and environmental degradation. United Nation Development Program (1998) estimates that more than 5 million people die each year from diseases related to poor solid waste disposal practices with much of the solid waste originating from the households. Since domestic solid waste form the bulk of SW generated in the urban areas it would be wise for any mitigation measures to focus on the household which is the main culprit in waste generation. On the other hand women have been identified as important actors in solid waste generation owing to their role in these households and could be crucial partners in resolving the waste crisis in the urban areas. Muller & Schimberg (1997), observed that women as having the primary responsibility for cleaning, food preparation, family health, laundry and domestic maintenance. Through community participation, women can supplement the efforts of the local authorities in solid waste disposal as part of their household chores. According to Aunshitx (1996), women co-operation is essential for long-term success of any project concerning urban services. Their co-operation could be through community participation in community based organization or non-governmental organizations.

National Environmental Action Plan (1994) defines community participation (CP) as the people's involvement in the identification of their felt needs mobilization of their resources, influencing direction and execution of environmental programs and projects.

2.1.1 Industrialization and Urbanization

The problem of solid waste can be traced back to the very beginning of civilization when humans gathered in communities. Waste generated then was managed and disposed of by natural process. During the industrial revolution however, there was an increase in production which led to the growth of urban centres in Europe and an increase in solid waste (Priestly, 1968).

Today most countries have undergone their own form of industrialization resulting to urbanization where town and urban centres have come up with dire environmental consequences. In a nutshell, urbanization is now becoming a global phenomenon whose ramifications are more pronounced in developing countries. The unexpected migration has caused the sprouting of slums and growth of squatters and informal housing all around the rapidly expanding cities of the developing world (Dimpal, 2012). The resulting concentrations of people in towns and cities as they migrate from the rural areas to towns in search of jobs and a "better" life has resulted in overcrowding and poor living conditions. This has in turn given rise to alarming magnitude of wastes being dumped in the streets and waterways.

UN Habitat, (2008) indicates that just as other countries in Africa, Kenya is experiencing rapid urbanization growth. As cities rapidly grow, so does the amount of waste that they generate. According to (UN Habitat, 2014) rapid urban growth in the developing countries is putting an extraordinary pressure on limited urban resources for the provision of the essential basic services, further straining capacity in urban management.

This is relevant to the study as the trend of migration and overcrowding is witnessed in the developing nations, which are unable to provide sound municipal services. There seems to be no respite in sight as the population of these countries continues on an upward trend coupled with the rising middle class and unrivalled waste generation. Mighua et al., (2009), notes that increasing population levels, booming economy, rapid urbanization and the rise in community living standards have greatly accelerated the municipal solid waste generation rate in developing countries.

UN Habitat (2014) further observed that sub Saharan Africa today is in the midst of a dramatic urban transition that will persist well into the 21st century. Between 2011 and 2035, the urban population is expected to more than double from approximately 298 million to 697 million. By mid-century, it is estimated that over 1 billion people will live in urban areas. In what a “waste” a global review of solid waste management published in 2012, Hornweg and Bhada-Tata examine how rising urban populations are creating larger and larger waste management problems for cities all over the world. The authors found out that the world’s urban residents are producing significantly more waste that they were just 10 years ago. Over that time, the waste generated by urban residents has nearly doubled from 680 million tons/year to more than 1.3 billion tons per year. By 2025, the report anticipates that the world’s urban population will be producing 2.2 billion tons per year

The views expressed here are important to the study because Kenya being a developing country is faced with overcrowding due to population increase which has seen an increase in solid waste generation. In recent years Kenya’s economy has greatly improved and people are now consuming more due to their rising standards and more so in towns. Also with the population trends projected, the challenges that the future holds in regard to solid waste generation in cities and towns would be unprecedented in human history.

The report by Hoornweg and Bhada-Tata (2012) further notes that the cost of dealing with all this waste, will pose significant problems for these countries. Today it costs about \$205 billion to manage municipal waste worldwide and by 2025 that cost is expected to increase to more than \$ 375 billion. Low and middle-income countries will be hit the worst by this increase in waste and cost, mainly because they are poor and also because they are rapidly urbanizing. The authors observe that how these countries deal with those amounts of waste will be crucial.

These statements and predictions are quite helpful to the study as they paint a gloomy picture of the urban dwelling in the world unless deliberate measures are taken to curb the challenge of solid waste management. The developing countries like Kenya will be on the receiving end due to the high costs associated with solid waste management given the financial constraints and budget deficits in this emerging economies and more so because of the high rate of urbanization.

2.1.2 The Solid Waste Problem

Nairobi the capital city of Kenya is characterized by low coverage of solid waste collection. There is pollution from uncontrolled dumping of waste and insufficient public services a scenario that replicates in all the major towns of this country. JICA (2010), observes that the collection rate in Nairobi is as low as 33% which leaves about 2,600 tones uncollected representing about 67% of the total SW produced. Municipal authorities charged with the responsibility of providing municipal services have found it increasingly challenging to play this duty (United Nations Environmental Program, 2010). This observation is relevant to the study as it reveals the lack of capacity by the municipal authorities to handle urban solid waste in the developing countries.

Domestic or residential solid waste makes the largest percent of the urban waste whereby much of this is organic. NEMA/ UNEP (2003) found that domestic waste accounted for 68% of the total waste generated in Nairobi, while non-domestic waste from industrial markets, roads and other activities contributed 32% of the total waste generated. Contriean (1996) estimated that in developing countries, the extent of organic waste is relatively high consisting between 40-70% of solid waste in these countries. In another study by JICA (2007), Dandora dumpsite household waste composition was as follows; Noncombustible 1.3%, paper 6.2%, metals 0.9%, diapers 13.3%, food waste 60.9%, and yard waste 3.9% plastic films 9.7% and mixed plastics 2.2%.

The study finds this statistics useful as they narrow down the problem of urban solid waste squarely to the household from where mitigation measures could be developed. Furthermore, a large proportion of this waste is organic mainly from food stuff where composting could readily be done to reduce the menace. Additionally, plastic packaging materials and baby diapers are wreaking havoc on the environment since they are not biodegradable. According to a research done by NEMA/ UNEP (2005) 100 million plastic bags are handed out annually in Kenya by supermarkets alone. These low density courier bags end up in homes, hospitals and other outlets where they are later poorly disposed. G.o.K demographic and health survey (2003) report indicates that Kenya's environment is facing an ecological crisis resulting from among other factors, the problem of plastic bag waste disposal. The daily standard of Tuesday, May 19, 2015, lamented that, "*polythene bags and plastic bottles are the biggest threat to the environment*. The report notes that: '*Everywhere you travel in Kenya, you will find polythene*'.

The developing countries are also fast adopting the use of baby diapers and preferring them to cloth diapers. As the African economies advance, the use of baby diapers has become quite fashionable and women and the girl child are again major stakeholders in this unfolding scenario compounded by poor disposal of these fast moving items. Kamat and Malkani (2003) states that disposable baby diapers have almost become indispensable in the list of baby care products as their use have been increasing steadily over the years. According to Assadourian (2012), since the advent of baby diapers in the market, they have become a symbol of affluence and sophistication. The increased use of these disposable diapers and sanitary pads however is associated with a number of environmental health challenges due to the poor disposal in the developing world devoid of waste separation. This used products end up clogging the drainages and littering the open spaces in the towns causing an eyesore to visitors and residents alike and are grounds for spread of diseases and infections. The Ministry of Health in Kenya contends that poor disposal of diapers is a leading cause of diseases as well as blockage of drainage in the country's major towns (Murage , 2013). Gheesta (2014) notes that the enormous volumes of sanitary napkins and diapers produced and the threat they expose to the environment are very real, on top of that, due to the increasing aggressive marketing, we have a situation where we are running out of space for waste disposal. For example, it is estimated that 42 .6 million Indian women will throw away 21.3 billion sanitary napkins into a landfill in their lives, a very frightening reality.

The above revelation is important to the research since women are in focus here through use of these items of modernity whose poor disposal is threatening the environment.

2.1.3 Solid Waste Management

Despite the attention that scholars have given to urban solid waste subject, the problem of poor disposal persists. In the developing countries, it is more pronounced since the municipal authorities find it difficult to deliver proper services to the urban residents. The authorities normally site non-payment of the monthly rates by the residents especially the low class for the shoddy services they render in these neighbourhoods. Habitat (1992) observes that the limited capacity of low-income urban communities to pay for services and the fact that majority of these communities pay little or no municipal taxes have often been used as argument not to serve these communities. This revelation is pertinent to the study because other ways of providing these vital

services must be devised. In order to mitigate this shortcoming, many countries in the developing nations have sought community cooperation. Africa Medical Research Foundation's project in poverty areas has demonstrated that residents are willing to participate in cleaning up their neighborhoods and to share some of the costs associated (Davinder, 1987). Syagga (1992) supports this proposition and says that the community sector is an effective way to increase access of the poor to urban services including SWM. Additionally, a report by the World Watch Institute (1987) embraces CP in SWM and gives examples of a number of Chinese cities like Beijing, Shanghai, and Tiajin which have coped with garbage through this approach and informal sectors. It further argues that SWM requires the concerted effort of many actors and give examples of, Community Based Organizations, Non Governmental Organizations and Small and Medium Size Enterprises.

Nevertheless the role of women has been completely neglected by these scholars. There is no mention of the role they should play in SWM either in groups or individually despite their daily duties being concentrated in the households. This is one of the gaps that this study aims to fill through first, appreciating that household waste forms the bulk of the urban solid waste and secondly the fact that women play a central role in the house hold and thus are important actors. Furthermore, the community is an important factor in solid waste generation and as such should feature prominently in its disposal. However, the scholars consider the community as a single entity whiles us it is a composition of many groups each with different roles and priorities regarding solid waste generation and disposal and hence should be viewed in isolation. This study will investigate the role of women in the household and economic activities they undertake since they are important agents of SW generation. According to Douglass (1992) by targeting women, the party responsible for most decisions about waste disposal is isolated. The Centre for Agriculture Policy Research Extension and Development (CEAPRED) model he proposes views households as the single most important agent of waste production. It seeks to create pressure groups of women who educate and facilitate recycling and waste disposal in their communities. This is in line with the study because the role that women play in these entities is under scrutiny because of the residential solid waste that is generated.

The solid waste menace put away potential buyers who avoid such places because of the filth of solid waste. Tourism especially at the coast is largely affected and much revenue lost. A report

carried in the *Daily Nation of December 13th 2014*, indicated that Mombasa hotels were reportedly canceling planned city tours for tourists because of heaps of uncollected and unsightly garbage in the streets.

Further, if they were to observe proper SWM habits, it would greatly reduce the amount of garbage witnessed in the major towns the majority of which is generated from domestic chores performed by women. They are also responsible for either taking out waste to the communal bin or ensuring that it has been done.

Considering that no single waste management approach is suitable for all streams in all circumstances, the US Environmental Protection Agency (EPA) has developed a hierarchy ranking the most environmentally sound strategies for municipal solid waste. The hierarchy places emphasis on reducing, re using and recycling (3Rs) the majority of waste as demonstrated in the diagram below;

Figure 1: Waste Management Hierarchy



SOURCE: *U.S. Environmental Protection Agency, 2000.*

Bloom (1995) indicates that composting of organic waste and recoveries through recycling of dry waste has been strongly recommended as the solution to the problem of RSW. Many efforts have been made through awareness building to embrace household segregation of organic waste for enhancing social welfare. Even without raising revenue, an environment free from unattended

solid waste is a welcome outcome. Habitat (2004) observes that providing a social service is usually the primary driving force in CBOS for SWM where breaking even is sought rather than making a profit. Women are strategically positioned to undertake reuse and recycle of household waste and their active involvement in sound SWM would evidently supplement their livelihoods. There may often be seen engaging their children in this exercise. Furedy (1990), shares a similar observation when he states that, the use of wastes by poor households to meet their basic needs is observed in all developing countries. The use of animal dung for fuel and agricultural residues including urban vegetable wastes, such as coconut husks and shells has been documented in a number of areas. She also notes that women as the providers and organizers of daily household needs are responsible for marshaling these waste products, although they may often rely on their children to gather some of the wastes.

Another important consideration in the study is the aspect of behavior change and habit inculcation in children towards proper SWM practices. This aspect of molding children attitudes and behavior has been omitted by scholars and researchers in SWM for many years. Children are the future of any country. What they learn today would be applied in years to come and therefore the future is what the children are learning and practicing today even in terms of SWM. According to National Habitat II committee, Kathmandu, Nepal (1996) '*Improving Environment through Best Practices*' the ability of a society to improve its living condition will not be fully utilized if the younger generation is excluded from the process of consciousness development. It also implies changing their behavior about health and sanitation starting from the childhood. The paper further cautions that, without direct participation of children and adolescent in environmental matters, it will not be possible to find solutions. Timlett & Williams (2009) in "*The Impact of Transient Populations on Recycling Behaviour in a Densely Populated Urban Environment*" state that students with some knowledge and skills on environmental education are more motivated to take part in environmental endeavours. Sharing new information from their activities with families, adults and community will have some positive implications on SWM practices.

We strongly share this feeling that the role of education in SWM must never be underestimated. Besides informal education passed over from parent or guardian to children could prove more effective than the kind of formal education advocated by the scholars here. Education, either

formal or informal can help modify behaviour and attitudes on SWM. In fact, basic education for children towards proper SWM practices could after all be the missing link in SWM while many approaches have been applied without much success.

2.2 Theoretical Framework

Theoretical framework is the structure that can hold or support a theory of a research study. The theoretical framework introduces and describes the theory that explains why the research problem under study exists (Mugenda and Mugenda 1998).

2.2.1 Structural Functionalism Theory

Based on structural functionalism theory by Emile Durkheim, the study attempts to explain how institutions and social structures can be strengthened to offer sound SWM services to the society. According to this theory, the human society is organized through institutions which perform various functions for the continuity of the society. Durkheim viewed the human society as an organism made up of interrelated structures and social institutions. The theory states that one organ can affect the others and ultimately the whole due to this interdependence.

The study attempts to find out how women can play a role in SWM in the residential areas of Malindi to affect the overall SW situation in the town. This is based on the understanding that women represent a certain institution in the society whose role has a bearing to the SW practices in this town. The municipal authority represents the whole while women individually or communally represent a social structure whose activities could affect service delivery in the municipality and vice versa. Through this theory, the study is expected to provide remedies on SWM by suggesting possible measures aimed at strengthening the existing social structures and institutions featuring women.

2.2.2 Theory of Habitus

The study is also being based on habitus, a theory advanced by Pierre Bourdieu. Habitus describes one's physical and psychological appearance and behaviour as a result of habits developed over a period of time. It develops a person's attitude towards society and influences the way they react to the world around them. Bourdieu believes that an individual is as a result of the internalized influences throughout their life and as such the study tries to link this

influences to SWM habits and practices. Therefore, it tries to propose ways on how women can instill good habits and values in children concerning solid waste management.

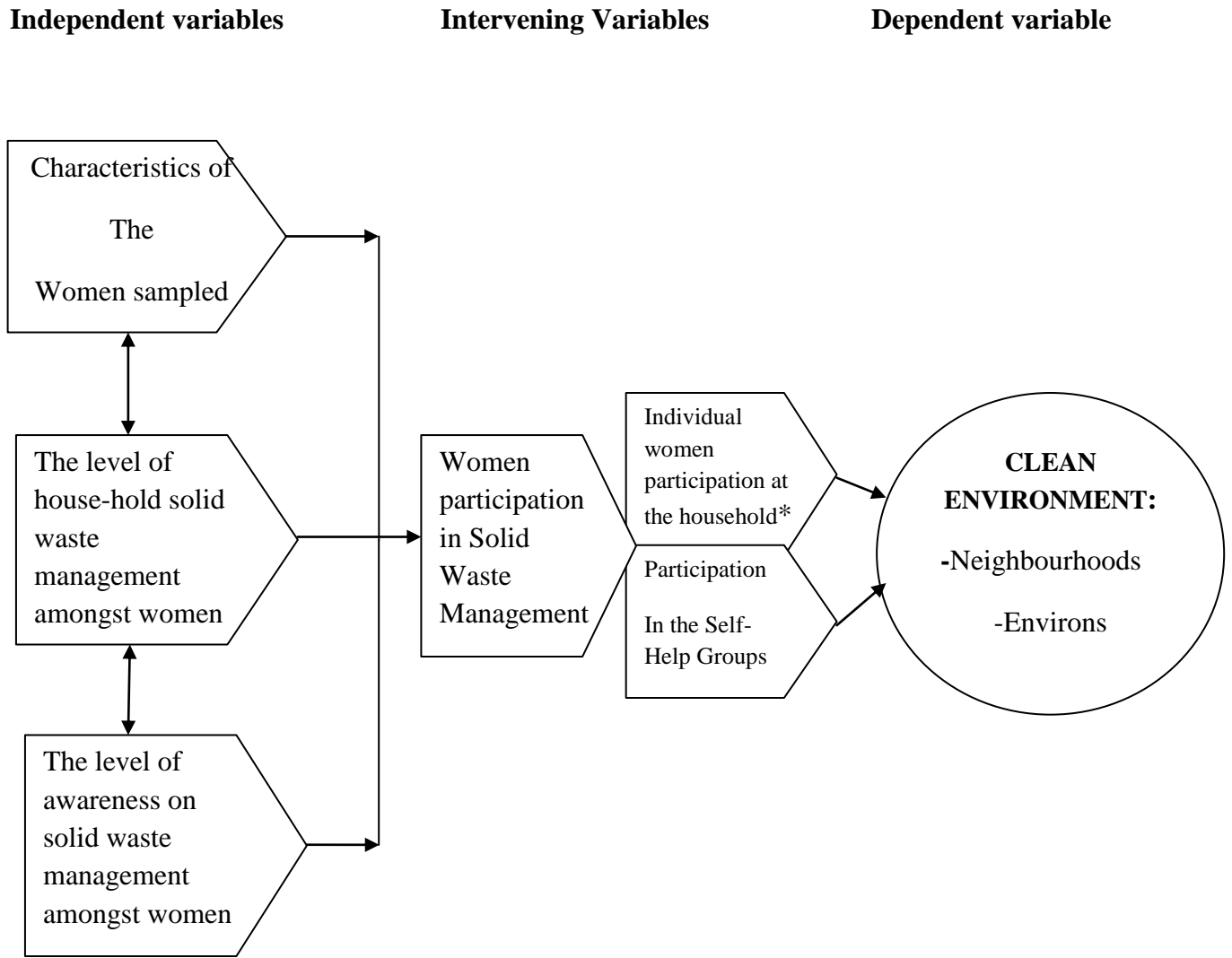
2.3 Conceptual Framework

Figure 2: presents the conceptual framework used in this study.

The dependent variable is a clean environment (clean neighbourhoods and environs) while the independent variables were; the characteristic of the women sampled, level of SWM and awareness in solid waste management amongst women and the level of participation in SWM amongst women .

Through awareness by women, best practices on waste disposal are learnt by the children and residents in the area influenced by behavior change. Awareness also determines the level of household solid waste management because women are important actors in the household especially regarding waste generation and handling. Women participation in SWM individually and in the SHGs is influenced by the characteristics of the women e.g income level, age etc and also by the level of their awareness on the need for a clean environment. A clean environment is finally dependent on the women awareness, the level of individual women participation in household SWM and in SHG disposal activities. Individual women participation in SWM activities at the household level has an aspect of children involvement in disposal of waste.

Figure 2: CONCEPTUAL FRAMEWORK



**Individual women participation also entails some degree of children involvement in SWM at the household level.*

Table 1: OPERATIONALIZATION OF VARIABLES

INDEPENDENT VARIABLES		INDICATORS
1.	Characteristics of women	<ul style="list-style-type: none"> • Income level, religious affiliation, age, education level, marital status, status in household (i.e. head of household or not)
2.	Level of SWM in the households	<ul style="list-style-type: none"> • Challenges of waste disposal in the household • Waste disposal methods by the house holds • Whether the households recycle, reuse compost waste or even separate before disposal
3.	Awareness	<ul style="list-style-type: none"> • Knowledge about; reduce, reuse recycle, separate, compost, store and transfer of waste • Knowledge on the dangers of waste i.e. pollution on environment and health hazards • Knowledge on waste composition and disposal procedures
4.	Participation; i) Individual	<ul style="list-style-type: none"> • Whether the women participate in the 3Rs and home composting • Whether the women participate in communal RSWM • Whether the women involve children in SWM
	ii) Participation through SHGs	<ul style="list-style-type: none"> • Self-help group registration status, composition

	<p><i>(factors that may affect/ determine women participation in the self-help groups)</i></p>	<p>and duration of women membership</p> <ul style="list-style-type: none"> • The goals and objectives of the self-help groups • Whether the groups have assets to facilitate participation • Whether the women contribute in the self-help groups-(cash or in kind). • Whether the self-helps have collaborations with development agencies.
<p>5.</p>	<p>Clean Environment:</p> <p>-Neighbourhoods</p> <p>-Environs</p>	<ul style="list-style-type: none"> • Garbage free neighbourhoods • No litter on streets and waterways • Clear drains

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Introduction

In this chapter, the mode of sampling, data collection and analysis is presented. The chapter also includes tools used for data collection and the details of the research site. Both qualitative and quantitative data were collected. The study made use of questionnaires and key informants using in depth interview guides. The use of secondary data mainly from publications, journals and internet was applied. The primary data was obtained from the respondents, either individually or in groups.

According to Irny & Rose (2005) methodology is the systematic, theoretical analysis of the methods applied to a field of study. It comprises of the theoretical analysis of the body of methods and principles associated with a body of knowledge. Barkeville (1991) describes methodology as the study or description of methods.

3.2 Site Description

The study was undertaken in Malindi, Kilifi County, a small town on Malindi Bay at the north of Galana River, lying on the Indian Ocean coast of Kenya. Formerly Malindi Municipality, the town is situated in the north coast roughly 120km from Mombasa city. It covers approximately 677 km² and is divided into 13 administrative wards, and has among world's best tourist hotels making it an important tourist destination.

The population of Malindi is about 207,253 according to (KNC, 2009) in the following wards: Jilore, Kanyuni, Canda, Malindi town and Shella. The town is native to the Mijikenda and the Swahili communities with a heavy presence of up-country communities mainly; Kamba, Meru, Kikuyu, Luo and the Luhya who undertake small enterprises. The most populous age group is 0-9 years which accounts for 32.8 % while male are 50.2% and female are 49.8% of the total population (National population census of 2009).

Table 2: Malindi Population by Ward

Ward	Population
Jilore	17,497
Kanyuni	17,965
Canda	35,562
Malindi town	51,254
Shella	43,434

Source: *Kenya National Census, 2009.*

Malindi has a tropical climate where the summer is much lower than the winters. The average annual temperatures are 26.3 degrees centigrade and an average annual rainfall of 1094mm. There are traces of foreign cultures and architecture everywhere in the town. Though the Portuguese set up shop in Malindi earlier and had great influence in the area, they weren't the only foreign power to assert their dominance here since the Arabs also colonized this part of the world at some point. Many European nations also brought visitors to this area where the British, French, German, Italians were among them. Today there is a substantial number of Italians permanently residing in Malindi.

There is limited number of factories in this town save for a couple of grain millers within the town centre, otherwise the town relies heavily on tourism, brought largely by deep-sea fishing and safaris. Tourism is the main economic activity here and the town has a number of good hotels, casinos, nightclubs, restaurants, bars and resorts. Malindi is also home to the famous white sandy beaches of Watamu and marine parks, which are traveler's paradise any day.

The research was carried out in Malindi town, Shella and Kanyuni wards. This town was selected due to the warm climatic conditions in the region which speeds up the rate of decomposition posing a great challenge of solid waste. The researcher having resided in this town has witnessed the numerous efforts by the Italian community here to rid the town off garbage without much success, making it worthwhile to conduct this study. Also while reviewing

literature the researcher observed that the bulk of the study on solid waste in the country has been conducted in major towns in Kenya excluding the coastal region. Malindi being a relatively small town in coast is a good starting point while the stakes are currently high to revive the tourism industry.

3.3 Research Design

The purpose of the design is to ensure that the research is relevant to the problem at hand and must be economical to undertake. It is always characterized by flexibility, appropriateness, efficiency and cost effectiveness.

According to Trochim (2005), research design provides the glue that holds the research together. It is used to structure the research, to show how all the major parts of the research project work together to address the central research question. Buins and Grove (2003:195) define a research design as a “blue print for conducting a study with maximum control over factors that may interfere with the validity of the findings” Parachoo (1997:142) on the other hand describes a research design as “a plan that describes how when and where data are to be collected and analyzed.”

In essence, the research design answers the questions: how are we going to get answers and test the hypothesis. Research design is a plan of actions indicating the specific steps that are necessary to provide answers to those questions test the hypothesis and thereby achieve the research purpose. This study adopted a descriptive approach.

The researcher could use both primary and secondary data to get insights on the challenges of SWM in Malindi town. The source of the primary data would be from respondents where a structured and semi structured questionnaire would be administered. The secondary data is from the literature review and the local administrative authorities and NGOs operating in the area that would provide invaluable information backed by statistics on the topic at hand. The choice of this design is justified by the fact that SWM is an essential service that indicates the service delivery of other crucial services offered by municipal authorities. As such there is need for a more holistic approach to any study pertaining to SWM to unravel the phenomenon that is perennial poor solid waste management practices in the developing countries.

3.4 Units of Analysis and Observations

The unit of analysis denotes the phenomenon being investigated. It's what the researcher is seeking to understand.

According to Trochim (2006) the first step in deciding how you will analyze the data is to define a unit of analysis. Your unit of analysis is the “who” or the “what” you are analyzing for your study. It is the entity that you wish to be able to say something about at the end of your study, probably what you consider to be the focus of your study. The unit of analysis is largely determined by your research questions.

A unit of observation on the other hand is an object about which information is collected. It is the item (or items) that you actually observe, measure or collect in course of trying to learn something about your unit of analysis. The unit of observation are the respondents in the research namely; women and the SHG leaders.

In the study the unit of analysis would be: participation level of women individually and in the SHGs.

3.5 Sample Size and Sampling Procedure

A sample can be defined as a smaller representation of a whole (savaharel mahal, 1992). It is a section of the population selected from the latter to represent the whole population. It is used to seek knowledge or information about a population by observing part of it in order to extend the findings to the whole population (Simpleton, 1988).

Two data collection methods were used to collect information pertaining to the research study: the survey method and focus group discussions. The survey comprised of a standard structured questionnaire as the data collection tool for the quantitative data. It consisted of the closed ended questions to capture relevant information and also open ended to get significant detailed information as well. To facilitate this, one on one interview was carried out by the researcher and three research assistants for a period of one week.

The sampling of the sub-sites, households and the SHG's is explained below;

3.5.1 Sub-Sites

The house hold survey was conducted in three of Malindi estates which represented the town with an approximately twelve estates. The estates selected were; Maweni, Kisumu Ndogo and Kibokoni. The estates had good road network and a vibrant mixed community consisting of both the migrants from upcountry and the coastal communities. Further, the estates were inhabited by low and medium income earners who were of much importance to the study since their estates were less serviced by the authorities.

3.5.2 Households

Ninety households were sampled in the three estates; Kibokoni, Maweni and Kisumu Ndogo. In order to obtain a representative sample and minimize bias, two stage cluster sampling technique was employed. Clusters of between 400-500 blocks each were established in each of the three estates. A hundred blocks were then selected in each of the three clusters representing the estates by simple random sampling. The researcher however did not sample all the elements in the clusters but picked just thirty blocks in each cluster through simple random sampling. Also, only one female member (who played an active role in domestic chores) was interviewed in every block.

3.5.3 Self-Help Groups

Self-help groups were sampled to get information on women participation in solid waste management. Multi-stage sampling was employed where a list of all the self help groups was obtained from the department of gender and social services in Malindi. Secondly, the self help groups that were oriented towards environmental conservation were singled out from the list and sampled. In total there were twenty groups of which five undertook environmental conservation and three were purposively sampled for this study; Malindi Green Town Movement, Kisumu Ndogo Maweni and Maisha Mpya self help groups.

3.5.4 Focus Group Discussion

A total of three focus group discussions were conducted i.e. one FGD in each area. A total of 18 women participated in these discussions which were held outdoors. A research assistant accompanied the researcher to each FGD to take notes on issues arising giving enabling a smooth discussion.

The participants were chosen using the purposive sampling method because the study targeted women in the households who actively participated in domestic chores. To obtain the sample of six women per area, the researcher ensured that those who participated in the house hold survey did not take part in the group's discussions.

The purpose of conducting the FDGs was to enable the researcher to obtain qualitative data to supplement the quantitative data collected using the survey method. It also helped validate the quantity data from the respondents on the subject.

This method proved effective since the participants appreciated the problem at hand and also embraced the idea of community participation in resolving their social problems.

3.6 Data Analysis and Presentation

Data analysis is the process of inspecting, cleaning, transforming and modeling data with the aim of discovering useful information, suggesting conclusion, and supporting decision making. Quantitative data collected using the survey method was analyzed using descriptive statistics tool (SPSS), where pie charts, graphs and percentages were generated with prior coding of the responses. The qualitative data collected through the FDG's was analyzed for content to support the findings from the study (i.e. narrative analysis).

CHAPTER FOUR: DATA ANALYSIS, PRESENTATION AND INTERPRETATION

4.1 Introduction

This chapter presents the findings and analysis of the study as set out in the research on Women participation in residential solid waste management in Malindi town, Kenya. The data was gathered through questionnaires and focus group discussion designed in line with the study objectives.

4.2. Characteristics of the Respondents

The first objective of this study was to analyze the characteristics of the women sampled; Age, marital status, religious background, the household head level of income, type of residence, ownership, and length of stay.

4.2.1 Age Distribution

Thangeta et al.,(2002) states that households attributes such as age, gender, occupation level and of income are important factors in analyzing the participation of people in community work.

From the sample of 90 households, majority of women (48.4%) were between 30-39 years of age, 31.9% were found to be below 29 years, and 18.7% were between 40-49 years while 1.1% in the sample were over 50 years of age.

Table 3: Age of the Respondents Sampled

Age	Frequency (n)	Percent (%)
Below 29 years	29	31.9
30-39 years	43	48.4
40-49	17	18.7
Above 50 years	1	1.1
Total	90	100

Age is a crucial factor that could affect participation. On the one hand as a measure of experiences, age could have a positive effect on participation. On the other hand older people are more likely to resist change (Epperson and Flothes, 1983). In this case, the majority of the

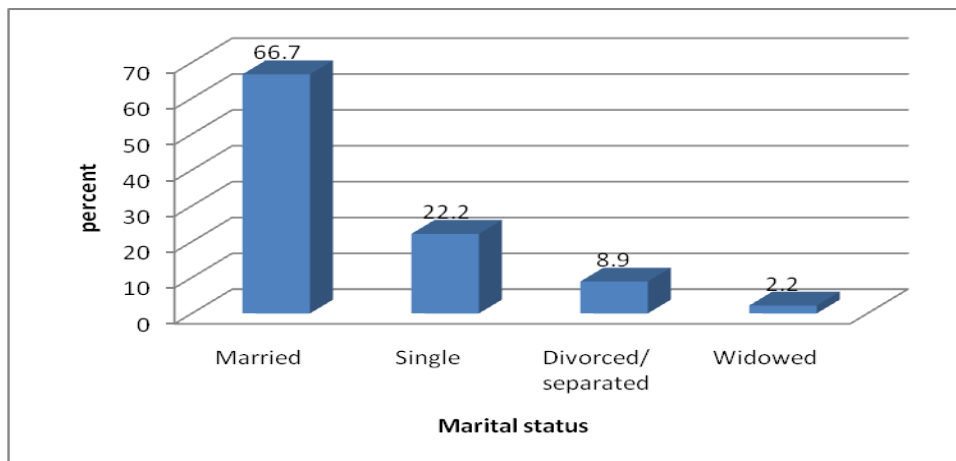
respondents are in the active age 30-39 years where they are more likely to participate in communal work including SWM while embracing modern technologies.

4.2.2 Marital Status

Those who reported to be married in the 90 households sampled were 60.3% while 19.8% were single, 7.9% said were divorced/ separated while 1.9 were widowed.

Married women may undertake (participate) in low income economic activities (e.g home composting) due to the push factors such as husband's low wages (Rutashobya, 1996).

Figure 3: Marital Status of the Respondents (n=90)

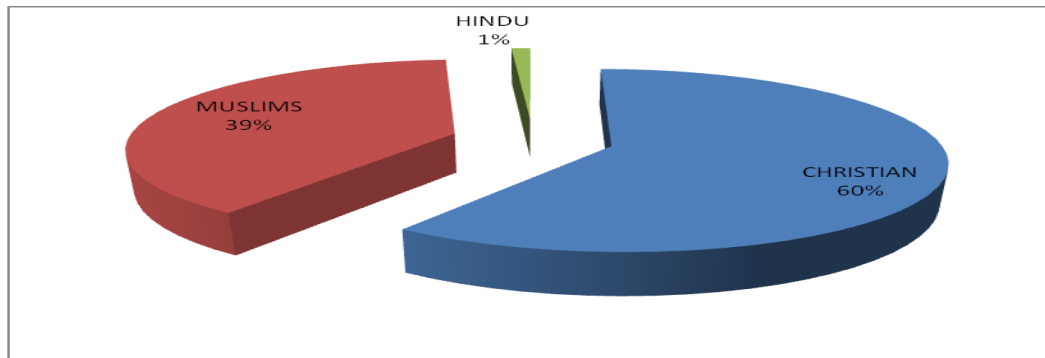


Married women are more likely to participate in communal work because they are not financially constrained like the un-married women who prefer to use any extra time or dime in boosting their income. SWM could offer opportunities for them to generate some revenue through recycling waste materials and composting organic waste from their neighbourhood.

4.2.3 Religious Background

Religious beliefs of an individual may influence households waste disposal practices and the level of participation in communal tasks. According to Furedy and Pitot (2004), societal values and religious beliefs underpin much of waste behaviour and reuse practices.

Figure 4: Respondents' Religious Affiliation (n=90)



The study revealed that most of the respondents were Christians at 60%, Muslims 38.9% and Hindu 1.1%.The respondents affiliated themselves with some religion a factor that could influence waste disposal habits.

4.2.4 Educational Level

About half of the respondents (50.5%) had a primary level of education, 33.3% had secondary education, and 6.7% had college / university education while 9.9 % had no formal education.

The level of education among individuals influences solid waste disposal behavior. Having basic education and above meant that the respondents were more conscious of the environmental degradation.

Table 4: Respondents Education Levels

Level of education	Frequency (n)	Percent (%)
Primary	46	51
secondary	30	33
College/ University	6	7
None	8	9
Total	90	100

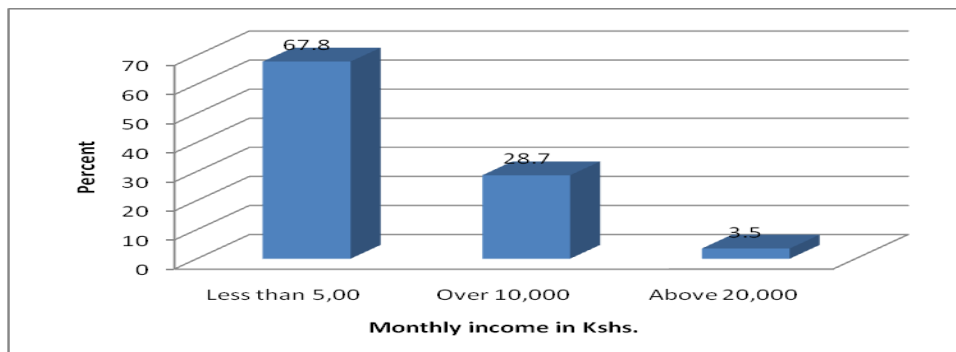
According to Pacey (1990), formal education for women is a prerequisite for change in sanitation behavior. Furthermore, De Luna Era (1996) observed that, if education does not specifically address solid waste, there is unlikely to be any effect on waste behaviours and that specific school education can affect household habits.

4.2.5 Income Level per Month

Out of the 90 women sampled 67.8% earned less than ksh.5,000 per month, 28.7% earned over Ksh. 10,000 and 1.1% earned above Ksh. 20,000 respectively. The level of income of individual households has direct influence on the need for a cleaner environment. Also, it may influence the readiness to participate in waste recycling for example in order to generate some revenue for the family.

The respondents were financially constrained and they would be willing to participate in communal work for employment.

Figure 5: Respondents Monthly Income (n=90)



According to Zerbock (2003), there is a general agreement in the environmental economics literature on the positive relationship between income and demand for improvement in environmental quality. Besides, households with higher income would be more likely to participate in community work than lower income households since the former would even hire labor if need be (Thangata, Hildbrand& Gladwin, 2002).

4.2.6 The Kind of Residence of the Respondents and Ownership

The study sought to know the kind of dwelling place of the respondents which is an indicator of their status in the social setting.

According to (Awunyo, 2006) ,those living in their own houses are expected to be more willing to pay (or participate in improving the SW services) compared to tenants, because the premises belong to them and if the place is clean they have more value for the property.

Majority of the residents (56.7%) lived in a single house, 28.9% resided in detached house, while 10% lived in an apartment and those who lived in semi detached house were 4.3%.

Table 5: Kind of Residence Reported by the Respondents

Type of housing	Frequency (n)	Percent (%)
Single	51	56.7
Detached	26	28.9
Semi-detached	4	4.3
Apartment	9	10.1
Total	90	100

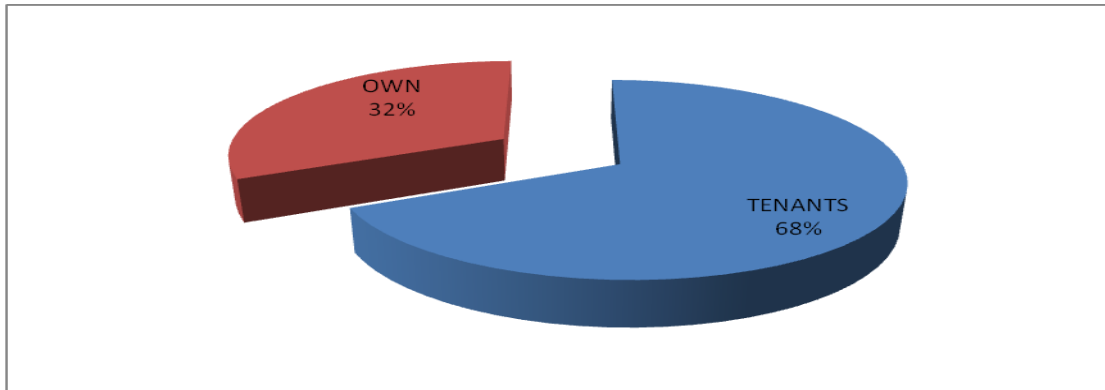
The data therefore tells us that the majority of the residents in the estates sampled lived in single houses, which were actually rented. The neighbourhood hosted very many residents living in close quarters where space was a major concern, as such; it was difficult to undertake practices aimed at waste reduction. Le (1995) for example states that householders in crowded dwellings find space a constraint in separation of waste if storage is necessary.

According to UNEP (1996) residential composting should be promoted when a significant number of homes have individual or collective yards or gardens and if there is sufficient space.

Out of the 90 respondents, 61 of them (68.1%) were found to be tenants in those houses while 29 or 31.9% owned the houses.

In this case, participation in some SWM procedures would be affected due to limited space. Furthermore, the residents would be less willing to clean the environments since it's rented and they would expect the owner to keep it clean.

Figure 6: House Ownership (n=90)

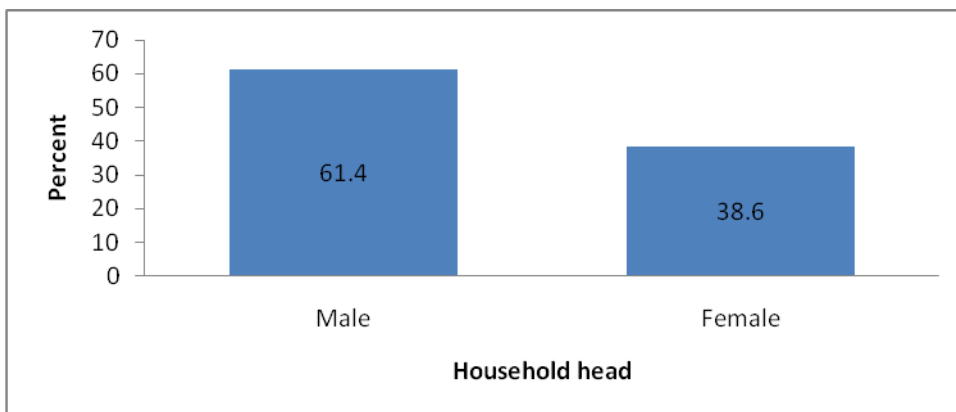


4.2.7 Household Head

The aim of this section is to establish whether a household is headed by male or female a factor that determines community participation due to the financial or resource implications. According to the data collected, thirty four of the households representing 38.6 per cent were headed by female while fifty four households or 61.4 per cent were male headed.

Thangata, Hilderbradt and Gladwin,(2002) observed that more often than not, female headed households are resource constrained particularly with regard to labour and cash than their counterparts male headed households.

Figure 7: Household Head (n=90)



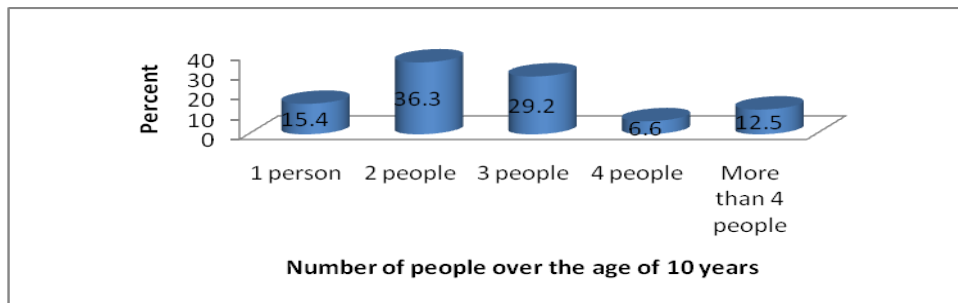
A significant percent of the respondents headed the households a factor that could affect participation.

4.2.8: Number of People Living in the Household

The study was interested in identifying the number of people in the households above the age of 10 years with the assumption that they were involved in solid waste management in one way or another and could be a factor for waste generated. From the survey, 15.4% of the households lived with only one person over the age of 10 years, the households that lived with 2 persons over this age were 33 households or 36.3%. Twenty-seven of these households or 29.2% had three persons over the age of 10 years while in 6.6% of the households lived four people over this age of 10 years old.

Majority of the households had 3 persons living over the age of 10 years of age meaning that space was limited given the kind of residential housing most of the respondents occupied. (Awunyo et al., 2006) notes that the more the children (10-15 years), the more they were likely to prefer to use them to clean the environment than paying more to the authorities to clean the environment

Figure 8: Number of People over 10 years of Age in Household (n=90)



4.2.9 Duration of Stay in the Neighbourhood.

The respondents were surveyed on the length of time they have lived in the neighborhood where 60.5% of the respondents representing the majority had stayed for 1-5 years, 27.8% had lived for more than 5 years while 12.1 % were new comers having lived in the neighborhood for less than one year. The length of time that the respondents lived in the neighborhood for was important to the study since the longer one stayed the more she became acquainted and increased their level of awareness and participation in solid waste related matters.

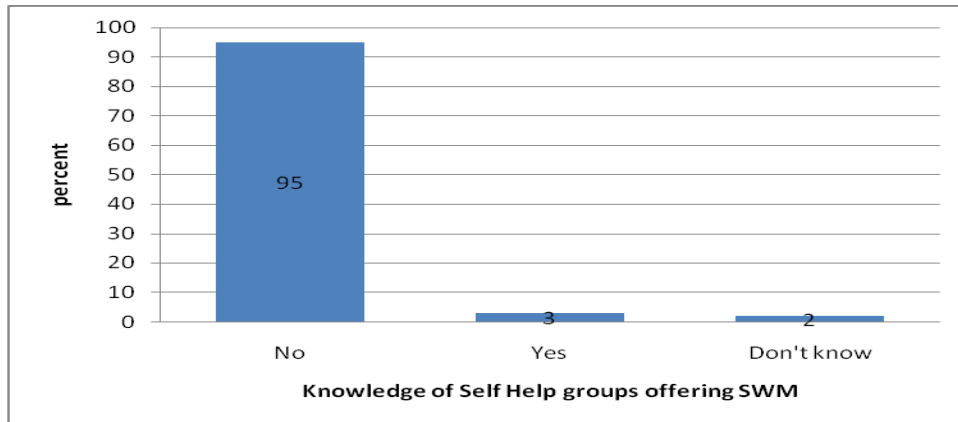
Also the longer one has stayed , the more he may appreciate the problem of solid waste management and be willing to participate to improve.

4.2.1 Self-Help Group Offering SWM Services

The survey sought to establish whether there one self-help groups offering slum services in the estates (town) where a vast majority 95.2% said they had not known of any, 2.2% stated that there were such groups while others 2.2% didn't know whether they existed or not.

It was clear that the respondents were not affiliated to any self-help groups engaging in environmental cleanliness and could hardly participate in communal SWM. It seems that Malindi town is lagging behind in incorporating the community in SWM due to lack of proper platform toward this end.

Figure 9: The Respondents' Reports of Self-Help Groups Offering SWM Services in the Neighbourhood (n=90)



It is conclusive from the above data that majority of the respondents were in the active age bracket of between 30-40 years and hence could fully participate community work due also to the fact that they are in the lower income bracket eager to make some extra revenue. The respondents lived mainly in single rented houses with lower service provision compared to high-income areas as such more participation would be required to supplement the county government efforts in SWM. The data also indicate that the respondents could contribute labour since there are at least two persons over 10 years old living with them. Also we have learnt that the respondents had lived in the area for more than a year and therefore had knowledge concerning the poor SWM and could be willing to improve the situation. However majority of the respondents were married and hence the households were male headed a factor that could hinder participation in community work. Finally, the residents of this town and the development

agencies had not fully embraced the idea of involving the community in SWM to supplement the county government, a factor that had contributed to litter lying un-attended in the estates and streets. There were no active self-help groups for example in sight to offer SWM services and the existing ones were not well known to the residents or were just dormant.

4.3 The Level of WSM in Households

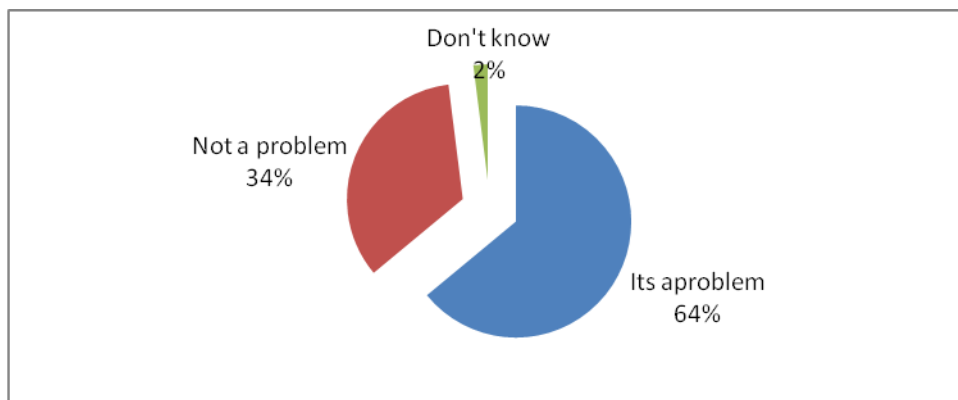
The second objective was to assess the level of Residential solid waste management in the households. The respondents lived in the low-income areas of Malindi where coverage by the county government concerning solid waste collection was low translating to poor levels of household management in the town. The study sought to establish whether there were challenges in handling and disposing waste at the household level, the methods of waste disposal and if the respondents applied the basic modes of waste reduction (recycling, reusing and composting). They were asked whether they separated waste before disposal. The above were indicators to measure the efficiency of handling waste at the household.

4.3.1 Waste Handling and Disposal Problems

The study sought to establish the women’s awareness on the solid waste by surveying the respondents on their perceptions on whether waste handling and disposal was a problem in their households. Out of the 90 respondents, 62.6% said there was a problem, 34.1% said handling and disposal of waste was not a problem while 2.25 % did not know.

This data clearly showed that most women felt that there was a problem of handling waste at the households hence confirming that the level of SWM at this level was poor.

Figure 10: Respondents’ Report on Waste Handling and Disposal at the Household (n=90)



4.3.2 Respondents Household Waste Disposal Methods

The study sought to understand how the respondents disposed waste at the household level. Out of the 90 respondents interviewed, 62% said they burnt the waste, 14% put in bins, 20% dumped waste outside, 2 % recycled and another 2% buried the waste. From the above information it's evident that despite much of the household waste being organic, the majority of the residents (62%) disposed it through burning. There was no mention of composting and only 2% actually recycled waste according to the data. This information leads to a conclusion that SWM at the households is no adequate given the mode of disposal by the respondents.

In addition, the researcher sought to understand how the respondents disposed organic waste because it made up to over 50% of household waste in the developing countries and as such if not properly handled could be an indicate of poor SWM. Out of 90 respondents, only 88 gave their views on this subject with 62.5% stating that they put this waste in a bin, 26.1% said they fed it to animals while 11.4% used the waste in the farms as manure.

Table 6: Respondents' Waste Disposal Methods

Mode of disposal	Frequency (n)	Percent (%)
Burning	56	62
Put in bin	12	14
Dumping	18	20
Recycling	2	2
Burying	2	2
Total	90	100

Table 7: Respondents’ Mode of Disposing Organic Waste

Dump	Frequency (n)	Percent (%)
Put in bin	55	62.5
Feed animals	23	26.1
Use in farm	10	11.4
Total	88	100

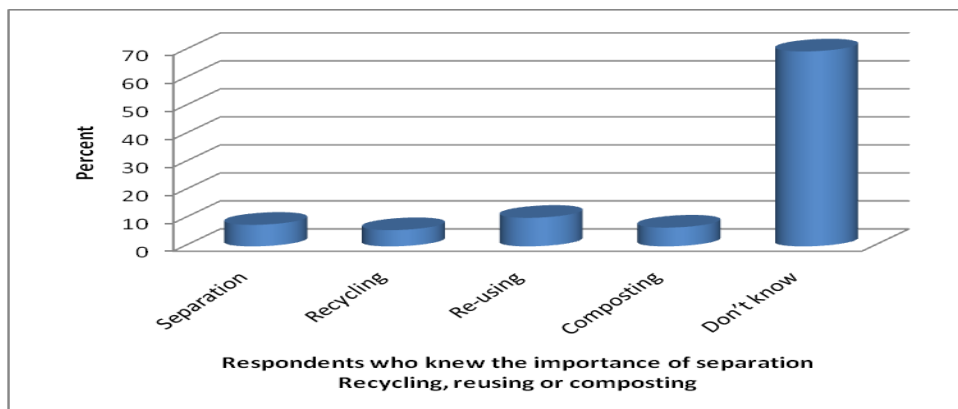
4.3.3 Separation ,Reuse, recycle and composting of household waste

This section sought to understand whether the respondents practiced waste reduction methods in the households which is a reasonable measure in the ability to cope with waste at this level.

According to Hoornmweg et al.,(2000) over 50% of an average city’s municipal SW stream in developing countries could be easily composted.

There is large number of plastic items consumed e.g. plastic bags and bottles and it would be important to recycle some of these items to reduce the plastic menace witnessed in the country. However, according to the respondents interviewed, only 7.7% knew about separation of waste, recycling 5.5% while 10.2% re used waste and 6.7% had knowledge of composting. About 69% had no idea on either of the above procedures of SWM. Without separation of waste at the household it’s difficult to recycle or compost owing to the waste complexity.

Figure11: Respondents Who knew the Importance of Separation, Recycling, Re-Using and Composting (n=90)



According to Nairobi City Council (2001), due to limited public awareness and negative perception of informal actors, there is little public support for source separation of waste, and waste recycling, re use and minimization.

Also (Allison,2010) noted that the total solid waste re use and recycling in the city is about 100-150 tons/day which was approximately equivalent to 3.7 % of total waste generated in Nairobi. Given these statistics, the respondents' lacked the edge to conclusively manage waste at the household.

The level of residential solid waste management was low in the town according to the residents who complained of lack of bins for disposal. Their disposal methods were mainly open dumping and burning since they even lacked the basic skill of reducing waste. This is what one of the residents said:

'In Malindi waste is thrown all over and no one complains, it has become the order of the day''

In conclusion, therefore, the data indicates that the level of RSWM in the households is wanting. First, majority of the respondents contended that there were waste handling and disposal problems in the households. Secondly, the disposal methods practiced in the households were inadequate in dealing with the waste. For instance, most of the respondents reported that they burnt the waste leaving much of the waste that did not burn dumped carelessly in the neighbourhood. Lastly, the respondents did not reduce the waste through recycling or composting indicating that most of the items used in the households ended up as waste compounding the problem further.

4.4 The Level of Awareness on SWM Amongst Women

The third objective of the study was to find out the level of awareness amongst women regarding residential solid waste management. The respondents were asked to state whether they knew or understood about some SWM practices, and their perception about efficiency and the problems posed by poor solid waste disposal.

Rehardyan et al. (2004) noted that participation in recycling of households waste relies largely on the level of awareness and understanding of recycling. According to Zurbrugg & Ahmed

(1999) there has to be first awareness that there is a waste management problem, and second the community needs to be aware that solving this problem is to their benefit.

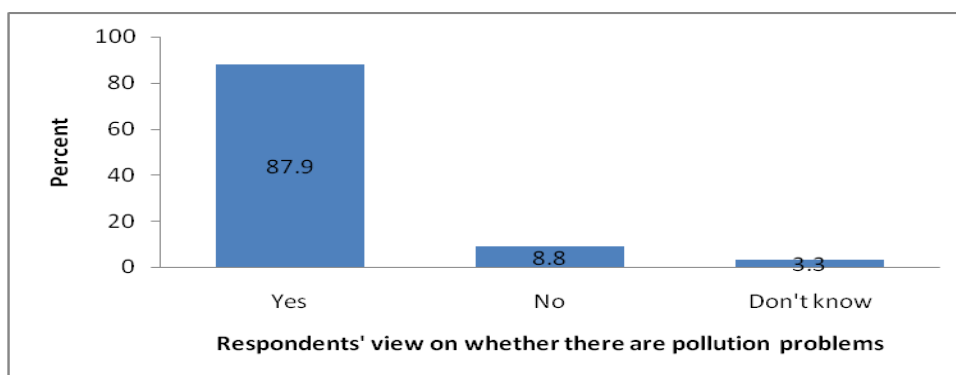
The challenges of urban solid waste start at the household's level due to failure by individuals to separate recycle and compost waste. This is because of lack of awareness of the simple waste procedures like recycling, reusing and separation of waste. Wright (2011) contends that people who are better informed tend to recycle more.

4.4.1 Waste Pollution Problems in the Neighbourhood

This section aimed at establishing whether the respondents are aware of the problems that are caused by poor solid waste disposal in the faith that they would be willing to intervene to through participation. The respondents told their views on pollution in the neighborhood where 87.9% agreed that there were pollution problems, 8.8 % said there were no problems of pollution while 3.3% did not know about pollution problems in the neighborhood. Since the county government lacked the capacity to offer adequate SW services especially in the low-income areas where pollution problems were rampant.

Its clear that the respondents knew of the pollution problems as the data indicates. Anschutz (1996) recognizes that a felt need is a precondition for successful realization of community participation in waste management.

Figure 12: Are there Pollution Problems in the Neighbourhood? (n=90)



4.4.2 Who was Responsible for this Pollution?

The residents felt that the county government was the party responsible for this problem with 57.6% of the respondents stating as much and 16.7% of the respondents thought that the

residents were responsible. A number of respondents (18.9%) could not tell who was responsible while 6.2% pointed in the waste collectors as being responsible of the pollution in the neighbourhood.

The members did not understand that the local authority was just a partner in the undertaking of slum services and that they (members) were the major stakeholders as the generators of waste, where house hold waste forms the bulk of the municipal waste.

Table 8: Respondents View on the Party Most Responsible for Waste Collection in the Neighbourhood

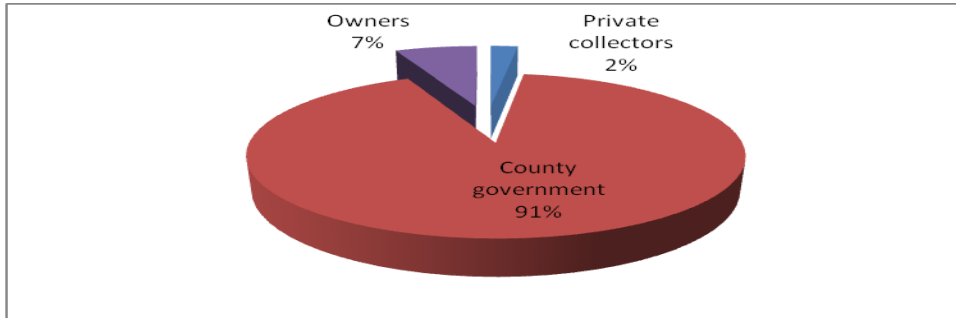
Most responsible for pollution	Frequency (n)	Percent (%)
County government	52	57.6
Residents	15	16.7
Waste collectors	6	6.2
Don't know	17	18.9
Total	90	100

4.4.3 Organization Responsible for the Waste Collection

The majority of the respondents interviewed felt that the county government formerly the municipal council was responsible for waste collection representing a whopping 91.2% with 2.2% of the respondents stating that private waste collectors were responsible while 4.4% felt that the owners of the houses (landlord/house owners) were solely responsible for waste collection.

A study done in Khulna, Bangladesh found that city dwellers thought because they paid taxes it was the sole responsibility of the city authority to provide them with a nuisance-free habitable environment (Mahmood et al., 2005).

Figure 13: Organization Responsible for the Waste Collection according to the Respondents (n=90)



The statistics are very consistent with this statement a situation that can greatly compromise the spirit of community participation.

4.4.4 Problems Caused by Improper Waste Disposal

Poor solid waste disposal causes environmental and health hazards to the community. Mosquitoes and other disease carrying vectors like rodents are prevalent in places with sanitary challenges. The respondents were very much aware of the myriad of problems caused by poor solid waste disposal as follows:

Table 9: Respondents Report on Problems Caused by Poor Waste Disposal

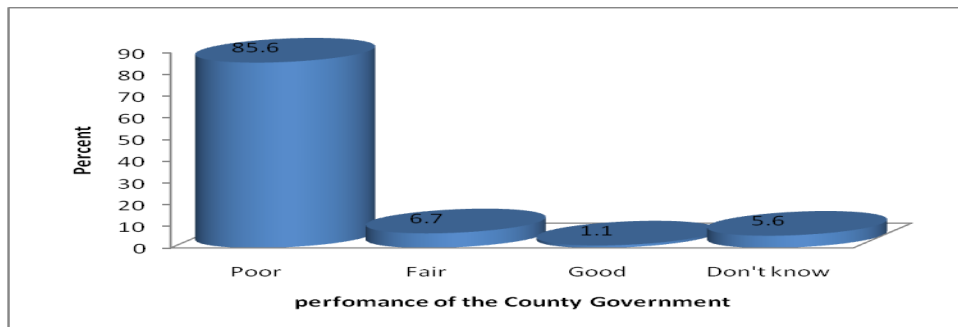
Problem	Frequency (n)	Percent (%)
1. Cause diseases	34	38
2. Harbor vectors	27	29.9
3. Air pollution	1	1.1
4. Reduce spaces	20	22
5. Not sure	8	9
Total	90	100

The data indicates that there is a real pollution problem resulting from poor SW disposal in the town that requires a joint approach to alleviate.

4.4.5 The Performance of the County Government

Majority of the respondents (85.6%) rated the performance of the county government poorly, six respondents or 6.7% said it was fair while one respondent or 1.1% rated it as good, five respondents representing 5.6% couldn't rate the performance. In most cities and towns of the developing countries, solid waste collection is dismal with uncollected garbage being the order of the day hence score poorly in this area as the respondents indicate.

Figure 14: Respondents' Rating of the Performance of the County Government (n=90)



According to JICA (2010), the daily collection rate of municipal solid waste in the city of Nairobi is as low as 33 per cent which leaves about 2,690 tonnes of waste uncollected.

The data above is consistent with the reality in most towns in the developing countries where the local authorities become overwhelmed by the amount of waste generated.

Everyone was aware of the solid waste menace in the town though they attributed it all to the county government. One woman lamented that; 'the county government had neglected their duties while they hike taxes at will'.

In conclusion, it was observed that the residents knew there was a problem that needed to be confronted since waste pollution was evident in the area. However, majority of the respondents believed that the role of SWM was solely the duty of the county government and they attribute the pollution to this actor and even rated it poorly in this regard.

4.5 Participation of the Respondents in SWM

The fourth objective of the study was to assess the level of participation of women in residential solid waste management. The Participation was assessed at two levels: individual women participation (i.e. at the household) and participation in the self-help groups undertaking SWM.

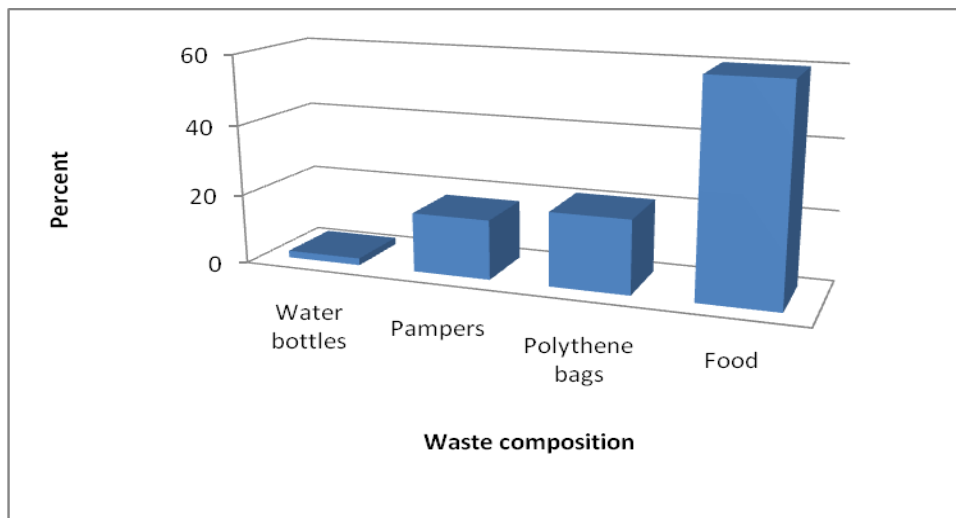
4.5.1 Respondents' Participation in SWM at the Household Level

At household level, the respondents were interviewed concerning the activities that they undertake towards solid waste management; waste separation at the source, neighbourhood clean-up campaigns and whether they involve children in waste control at the household. Also, the study would establish if the respondents knew the waste composition of household solid waste.

i. Household Waste Composition

This section aims at analyzing the composition of waste generated from the household. This revealed the respondents participation through stating the kind of waste they commonly handle at the household. The majority of the respondents (60 %) sighted food waste while 17% said baby pampers, 21% mentioned polythene bags and 2% sighted water bottles. According to data, it's clear that the respondents handled plenty of organic waste where composting if embraced by the residents either individually or in groups could significantly reduce the amount of RSW.

Figure 15: Waste Composition (n=90)



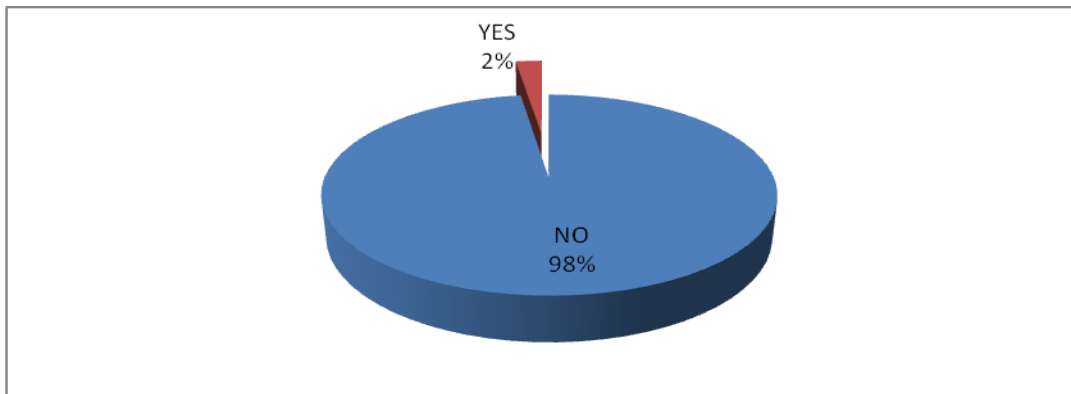
According to Hoornmweg et al., (2000) over 50 per cent of an average city's municipal solid wastes in developing countries could readily be composted. JICA (1998) indicates that food waste accounts for 51.5% of all residential waste.

ii. Respondents' Report on the Separation of Waste

Community participation can simply be some sort of contribution or involvement by the community, for example, it can even be the separation of waste at household level before municipal collection. Separation of waste at the source is important as it becomes easy and possible to identify materials to be recycled, re-used or composted.

The data obtained from the respondents showed that only 2% separated waste before disposal while the rest (98%) disposed waste in its mixed form.

Figure 16: The Respondents Who Separate Waste Before Disposal (n=90)



Lack of separation makes waste management a big challenge because the organic content makes it filthy and un-worthwhile.

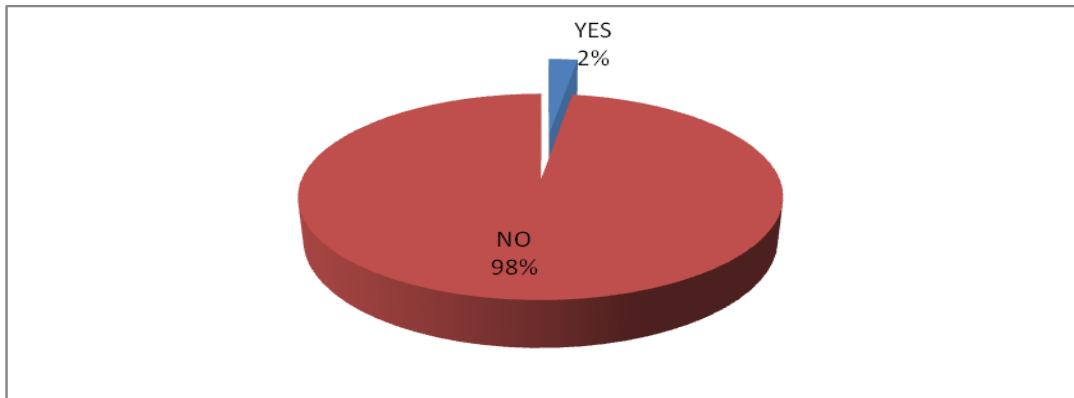
According to Contreau et al., (1984) for any recycling activity to take place, the waste has to be separated.

iii. Clean-Up Campaigns in the Neighbourhood

The respondents were interviewed on whether they had campaigns in the neighborhood which were aimed at supplementing the county government efforts in the slums. It turned out that the respondents did not have knowledge of these clean-up campaigns where 97.7% said that they had not had such endeavors while only 2.3% responded in the affirmative.

Clean-up campaigns is a good way of ensuring that individuals participate because it is done at the door step making it look attractive to join the neighbours to clean the environment a feat rare in Malindi.

Figure 17: Has there been Clean-Up Campaigns in the Neighbourhood? (n=90)

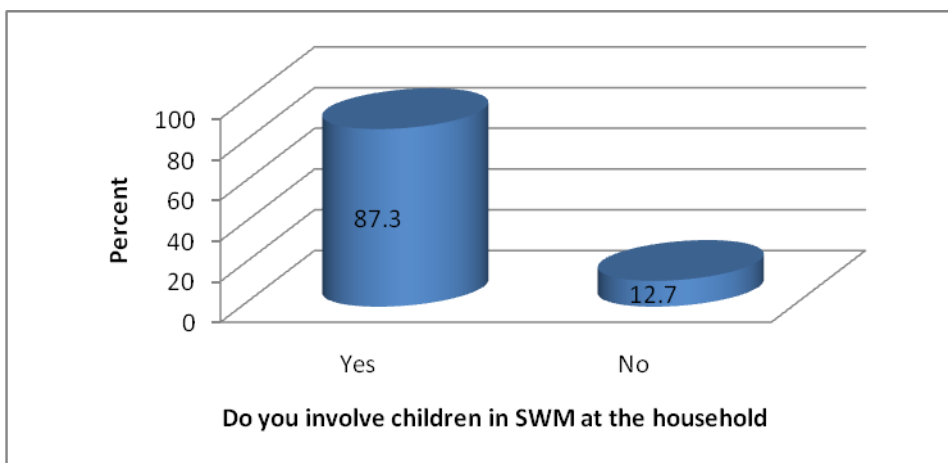


According to Kelling & Coles (1996), a well implemented cleanup campaign can improve the physical community, as well as create opportunities for the social fellowship and for individual investments and pride in the community.

iv. Involvement of Children in Household Waste Management

A large majority agreed that it was important to involve children i.e (87.3%) reasons being that this would help them acquire waste management skills for the future. The respondents frequently involved the children in the tasks of waste handling meaning that children were important agents of SWM.

Figure 18: Respondents' Report on Children Involvement in SWM (n=90)



A qualitative analysis by Achankeug (2003) showed that children move as much as 80% of households waste from the home to public bins.

4.5.2 Participation of Women in the Self-Help Groups

The researcher interviewed the SHGs' representatives in an attempt to understand the level of women participation in these groups regarding residential solid waste management. The following factors/ indicators were of interest as they directly affected and or determined their participation in these groups; (a) group registration status (b) goals and objectives of the SHGs (c) composition and duration of female members' membership (d) groups' assets (e) women contribution to the groups (f) and group's collaboration with development agencies.

Below is a list of Self-help groups in Malindi from which the researcher sampled to establish the ones concerned with SWM;

Table 10: List of Self Help Groups in Malindi and their Activities

	Name	Field of operation	Main activity
1.	Malindi Green Town Movement	Environmental conservation	Solid Waste Management
2.	Kwa Chocha Tegemeo	Empowerment	Boda boda
3.	Mambrui Self- Help Group	Empowerment	Agro business
4.	Majivuni Jitahidi	Empowerment	Small scale enterprises
5.	Mkange Umoja	Empowerment	Boda boda
6.	Watamu Timboni Imara	Empowerment	Table banking
7.	Dabaso Umoja	Environmental conservation	Bee keeping
8.	Ngalla Eden Elan	Environmental conservation	Tree nursery
10.	Msabaha SHG	Environmental conservation	Tree nursery
11.	Kisumu Ndogo Mama Msamaria	Health	HIV awareness

12.	Maisha Mapya SHG	Environmental conservation	SWM
13.	Miti ni Maendeleo SHG	Environmental conservation	Tree nursery
14.	Kisumu Ndogo Maweni SHG	Environmental conservation	SWM
15.	Kipepeo SHG	Environmental conservation	Butterfly and bee keeping
16.	Barani disabled SHG	Banking	Table banking
17.	Tuajalie Tujisaidie	Empowerment	Small enterprises
18.	Muyeye Ushindi	Health	HIV awareness
19.	Amani Women Group	Not defined	
20.	Barani Empowerment	Empowerment	Table banking

Source: Department of Gender and social services, Malindi (2014).

a) Goals and Objectives of the Self-help groups

The objective of the self-help groups indicates the groups' core business that was an important factor in determining partnership with local authorities pertaining community participation in SWM. For example, there were organizations that were concerned with environmental conservation without necessarily engaging in solid waste management.

The study revealed that of the twenty SHGs sampled only Malindi Green Town Movement, Maisha mapya and Kisumu Ndogo Maweni SHG were concerned with cleaning of the town through garbage collection and transfer. Previously MGTM was able to supplement the municipal authority's services until recently when there was need for more private actors as the waste generation in the town soared

b) Groups' Registration Status

Self- help groups and indeed any other organizations need registration before starting operation. This facilitates financial transactions e.g. opening of bank accounts and even attracting donor funding. It also enhances transparency and accountability and ultimately helps build members confidence which may affect individual and group performance.

Table 11: Groups' Registration Statuses

Name of group	Year of formation	Registration status
Malindi Green Town Movement	1993	Registered
Maisha Mapya	2012	Registered
Kisumu Ndogo Maweni SHG	2011	Registered

The study observed that all the groups sampled had been registered with the registrar of societies. In this case these SHGs could operate legally in the town, run accounts and even attract donor funding for their activities. Malindi Green Town Movement SHG was established in 1993 and together with Kipepeo SHG, they had been in the business of environmental conservation long enough. The longer the group is in operation may determine its effectiveness and financial status as would translate into experience of members and a broader collaboration network. The rest of the groups were hardly 10 years in operation a fact that could influence their performance and membership.

c) SHG's Composition and Length of Women Membership

According to the study of Ali and Snel (1999), women are largely responsible for household waste management, including the effective dealing with servants and informal waste pickers.

The length of women membership may determine efficiency in undertaking activities and was an indicator of stability especially if the members had been with the groups for long enough.

However, this was not the case with the SHGS here since men dominated the running of these groups.

Table 12: SHG'S Composition

Name of group	Number of members	Male	Female	Percent
Malindi Green Town Movement	45	27	18	40
Maisha Mapya	21	0	21	100
Kisumu Ndogo Maweni SHG	38	26	12	32

According to the sampled groups, it was well revealed that women were properly represented where Maisha Mapya SHG had a 100% female membership and Malindi Green Town Movement had 40%. This was very encouraging given the central role women play in household chores in the society.

Bulle (1999) stated that women first notice the deteriorating of environmental conditions, as they are usually associated with the duty of cleanliness of the home and of the family. They (Women) are responsible for the maintenance of the living space and health of the children and therefore have a strong sense of civic responsibility and desire to improve the living conditions and health situations. Women also observe a direct impact of the unsanitary such as infectious and childhood diseases and this is why they seek collective solutions for improving the environment.

Table 13: Length of Women Membership

Name of group Length of membership	Malindi Green Town Movement (n=18)	Maisha Mapya (n=21)	Kisumu Ndogo Maweni (n=12)	Average %
Under 1 year	12.4	30.6	42.5	28.5
Over 1 year	18.6	12.5	11.7	14.3
Over 2 years	26.3	28.8	33.1	29.4
Over 3 years	42.7	28.1	12.7	27.8
Total	100	100	100	100

The study learnt that women members from the three SHGs had been with the groups for an average period of less than five years. The majority of them (29.4%) had been members for over two years, 28.5% had stayed for under one year while those who had stayed for over three years were 27.8%, while 14.3% had stayed for over one year.

The data indicates that the members had been with the groups long to understand operations and the importance of participating, a factor that could determine performance. Also they appreciated the benefits of community work and could lure more women to join in.

d) Groups' Assets

The groups assets have a direct bearing with the performance of the group and hence the level of members' participation performance- equipment, tools of work and finance would facilitate member undertake their roles. Additionally, the SHG would realize their target objectives and be able to generate revenue to sustain the groups and the members. The information pointed to the need to equip the SHG for better delivery of SWM services.

Table 14: SHG's Assets

Name of group	Assets owned
Malindi Green Town Movement	One transport truck, nine wheelbarrows, furnished office at Shella,
Maisha mapya	3 wheel barrows, gumboots, spades and slashers
Kisumu Ndogo Maweni SH group	8 wheel barrows

The group assets have a direct bearing with the stability of the group and hence its performance since equipment, tools of work and finance would facilitate members to undertake their roles. Additionally, the SHG would realize their target objectives and be able to generate revenue to sustain themselves and the members. The information pointed to the need to equip the SHG for better delivery of SWM services.

e) Women Members' Contribution in the Self Help Groups

This section intended to unveil the real drive behind the members sticking with the groups and the motivating factor. In real sense, the members here are in the lower income bracket and it was important to establish why they offered their time in these groups. The study also sought to establish from the members the type of resources that they contributed to the groups.

Anshutz (1996) observed that, community members could participate in solid waste management by showing proper sanitation behavior, by contribution in cash or kind or labour, by participation in consultation, administration and management of solid waste services.

From the records of the groups, it was established that the women contributed variously; labour, money, ideas, decision making and equipment for waste collection (spades, fork jembes, etc).

Table 15: Women Contribution to the Groups

Name of group Contribution	Malindi Green Town Movement (n=18)	Maisha Mapya (n=21)	Kisumu Ndogo Maweni (n=12)	Average %
Labour	51.1	58.4	61.8	57.1
Equipment	29.3	24.5	28.5	27.4
Money	19.6	17.1	9.7	15.5
Total	100	100	100	100

Aunshix (1996) points out that women may not be interested in solid waste projects as a service, but its employment and income-generating aspect may interest them.

The representatives reported the kind of contribution the women made in the groups where an average of 57.1% offered their labour to the group, 27.4% provided equipment while 15.5% contributed money.

From the above data, it's clear that most (57.1%) members preferred to offer labour to the groups as earlier observed because they would earn some income.

Concerning reasons for participation in the groups, the SHGs representative reported that majority of the women (85.7%) sought to generate some income for themselves where providing labour assured them some monthly wage. Only 14.3% of the women members according to the representative participated in the groups because of concern for the environment.

f) SHGs Collaboration with Development Partners

This section aimed at revealing whether or not the SHGs got any assistance from other agencies and stakeholders.

According to Ikiara et al., (2004) about 55.6 per cent of CBOs report having been sponsored or facilitated by local and international NGOs and such UN agencies like the UNFPA and UNCHS (Habitat).

Table 16: Groups’ Collaboration

Name of Group	Type of support	Agency	Other support needed
Malindi Green Town Movement	Finances, transport trucks	Malindi Italian community, The Ford foundation, UN Habitat	Training
Kisumu Ndogo Maweni self help group	Transport trucks, plastic bags	County government	Funds, training and dumping site
Maisha Mpya self- help group	Waste collection implements; spades, wheelbarrows	County government	Funds, training, reliable transport and dumping site

The study established that the county government of Kilifi formerly the municipal council of Malindi has been keen to offer assistance to the SHGs in terms of trucks to ferry trash and tools of work. The municipality and MGTM had created a useful synergy all along which had made the town one of the cleanest in the country. Also it was revealed that all these groups had received support in the form of money from the Italian community living in Malindi.

It was clear that the SHGs had not properly positioned themselves to attract funding from the NGOs and other development agencies.

4.6 Conclusion

The study established that women participation was constrained by lack of proper disposal skills at the households. There were no clean-up campaigns in the neighbourhoods where a sense of community partnership could be enhanced. However, the women readily involved children in solid waste management although they hardly imparted any important knowledge to them. SHGs required support in the area of training the members in SWM in order for them to adopt the modern technology. The leaders of Kisumu Ndogo Maweni self-help group stated that they were not generating enough money to keep the groups afloat and in fact the members felt demoralized and unwilling to participate.

CHAPTER FIVE: SUMMARY ,CONCLUSIONS AND RECOMMENDATIONS

5.1 Summary of the Findings

From the study, all the respondents were able to answer the questions posed to them owing to their literacy level. The income level of the respondents was below Ksh. 5,000 per month and the large amount of waste in the household is organics (food waste), sadly though the residents are not aware of the benefits of composting where urban agriculture could thrive through use of the compost manure and they could fetch income from the same.

The respondent participation is limited to the knowledge of waste disposal and as such had not adopted modern and efficient modes of solid waste management. Also there is hardly any self-help group in the area and the existing ones are either dormant or ill equipped to facilitate adequate participation. Also clean-up campaigns are never held in the area and hence the residences lack a platform to interact and contribute in waste disposal communally.

It's worth noting that the respondents appreciate the need for involving children in household waste management where an overwhelming majority often engages the children. They realize the fact that the children need to learn essential skills for future use. However, the respondents rarely impart important lessons since they themselves are not aware of such efficient methods in SWM.

The study also found out that there indeed was environmental conservation oriented SHGs in Malindi that could become involved in SW work. However, only three were engaged in SWM in the town while the rest are more concerned with either the forest conservation or conservation of the beaches Apart from MGTM the other two groups started recently and are hardly five years old. As such, they were less active and had fewer resources to handle the task of SWM and actually required assistance in terms of skills and finances to be operational. Also it was clear that the groups were more concerned with collection and transfer of waste from the households and never advocated for separation, recycling, re using or composting waste.

Finally, the study established that the groups have not taken advantage of NGOs and other development agencies for funding and other assistance. The SHGs were therefore ill equipped to perform the task of solid waste management adequately.

5.2 Conclusion

Following the revelations resulting from the data, the respondents having a high literacy level can easily be trained (enlightened) on efficient ways of SWM. Since the respondents are in the lower income bracket (under KSH. 5,000), it offers an opportunity to inform them on how to view waste as resource in the wrong place and start programs to recycle and compost waste for revenue generations.

It's important to inform the residents on the importance of participation in SWM since the county government is financially constrained to offer satisfactory services.

Self-help groups should also be encouraged to venture in environmental conservation to supplement the county government. Also the women must be equipped with proper knowledge of waste handling as this would automatically be transferred to the children whom they readily involve at the household level. Development agencies need to move in and boost the efforts of the existing groups and encourage formation of more such groups.

5.3 Recommendations

The recommendations are made for the purpose of policy formulation and for further research;

5.3.1 Government and Development Agencies

People's participation must be encouraged to supplement the local authorities in the provision of sanitary services. This could be done through the strengthening of the existing self-help group and formation of neighborhood environment committees to oversee this.

Policies to be formulated to ensure solid waste education in inculcated earlier in life of the children through inclusion of such studies in the curriculum of the schools. The government must also set out clear guidelines towards proper waste disposal requiring all suppliers and manufactures of household items offered to the market e.g. plastics, pampers, beauty products (human hair etc.) would be disposed at the household level. They could provide training and clinics or run adverts on the disposal methods. Strict measures and penalties for offenders must be put in place by the government at all levels to safeguard the environment.

Bangladesh for instance, imposed a ban on plastic bags in March 2002 following flooding caused by blockage of drains (Expanded Primary Health Care, 2002).

5.3.2 Households

Deliberate efforts must be made to enlighten the residents on their role in cleaning the environment. Women having the key role in the households need to be equipped in the modern skills for waste handling, which they would automatically pass to their children.

5.3.3 Future Research

The study recommends that another study be carried out to establish the role of children in SWM at the household level.

According to Achankeng (2003) children move as much as 80% of households waste from the home to the public bins. As such, their role cannot be underestimated and ways of creating synergies with the household's keepers could be established by such studies.

The economists ought to conduct a study to estimate the loss of revenue caused by SW menace in the urban areas of this country for everyone to appreciate the magnitude of this problem.

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APPENDIX I

A SURVEY ON URBAN SOLID WASTE: *THE PARTICIPATION OF WOMEN IN RESIDENTIAL SOLID WASTE MANAGEMENT IN MALINDI TOWN, KENYA.*

Dear respondent,

My name is Felix Ngugi, a graduate student at the University of Nairobi. I’ am currently undertaking a study on women participation in Residential solid waste management in this town as part of my Masters Degree academic requirement. Your participation in the research through the responses you give will be highly appreciated while I promise to treat everything you say with utmost confidentiality.

Name of the respondent (optional).....Estate.....

SECTION A: PERSONAL CHARACTERISTICS

1. Age bracket, below 29 years___ 30-39___ 40-49___ over 50 years___

2. Marital status: single___ married___ divorced/separated___ widowed___

3. Religion : Christian___ Muslim___ Hindu___ (other) specify_____

4. Level of education: None___ primary___ secondary___ college/University___

5. Income level per month: under KSH. 5,000___ over KSH. 5,000___ over KSH.10,000___ over KSH.20, 000___

6. What kind of residence do you live in? Single___ detached house___ apartment___ semi detached___ other.....

7. How many people live in your house that are over 10years old? 1___ , 2___ ,3___ , 4___ 5)___ more___

8. Do you rent or own this house? Rent___ own___ other_____

9. How long have you lived in this neighbourhood? Under 1year___ over 1year ___
over 5years___

10. Are you the head of this household? YES___ NO___

SECTION B: AWARENESS ABOUT RESIDENTIAL SOLID WASTE MANAGEMENT

11. Is waste handling and disposal a problem in this household? YES___ NO___ DON'T
KNOW___

Give reasons.....

12. Are there waste pollution problems in your neighbourhood? YES___ NO___ DON'T
KNOW___

b) If yes, who do you think is responsible for this pollution in the neighbourhood?

Residents___ Waste collectors___ County government___ other

13. Are there self-help groups or private companies offering waste disposal services in this
neighbourhood? YES___ NO___

b) If yes name a few.....

14. In your opinion, what body or organization is responsible for disposal of waste in this
town?

b) What is the role of the county government in residential solid waste management?

c) How has the county government performed in this role?

15. What are some of the problems caused by improper waste disposal?

.....
.....
.....

b) Would you say waste disposal is efficiently carried out in this town? YES___ NO___
DON'T KNOW___

c) If no why?

16. What are some of the household waste in your neighbourhood?

.....
.....

17. In what ways are the following modes of waste disposal useful?

- a) Separation
- b) Recycling
- c) Re-using
- d) Composting

SECTION C: PARTICIPATION OF RESPONDENTS IN RESIDENTIAL SOLID WASTE MANAGEMENT

18. Which wastes does your household produce each day/weekly?

.....
.....
.....

b) Do you sort/separate the waste before disposal? YES___ NO___

c) If yes, in which ways.....
.....

19. How do you dispose the household waste?

b) If collected by private company or self help group, how do they dispose it?

c) If you compost the waste, what do you use it for?

20. What do you do with organic waste materials from your kitchen e.g. vegetable peels, egg shells e.t.c?

21. Have there been any clean up campaigns in your neighbourhood? YES___ NO___

b) If yes, by which organization/group?

c) What was it about?

d) Did you participate? YES___NO___ if yes hat did you learn?

22. Do you re use and or recycle house hold waste? YES___ NO___

b) If yes why, and in which ways.....

SECTION D: MEMBERSHIP IN RSWM SELF HELP GROUP

23. Are there self help groups in this neighbourhood engaged in residential solid waste management? YES___ NO___

b) If yes, which one are you a member of?

c) How long have you been a member?

24. What are its goals and objectives?

25. How many members does the group have?

b) In which ways has the group assisted you with your household waste?

.....
.....
.....

SECTION E: INVOLVEMENT OF CHILDREN IN RESIDENTIAL SOLID WASTE MANAGEMENT

26. Do you involve your children in cleaning the household and disposal of waste?

YES___ NO___

b) If yes, how frequently?

c) Why?

d) If no, why don't you involve them?

27. In your opinion, do you think it's important to involve children in cleaning the house hold?

YES___ NO___

b) Why?

APPENDIX II

A SURVEY ON URBAN SOLID WASTE: *THE PARTICIPATION OF WOMEN IN RESIDENTIAL SOLID WASTE MANAGEMENT IN MALINDI TOWN, KENYA.*

My name is Felix Ngugi, a graduate student at the University of Nairobi. I am currently undertaking a study on women participation in Residential solid waste management in this town as part of my Masters Degree academic requirement. I intend to interview you concerning the group where your voluntary participation through the responses you give will be highly appreciated. I do hereby promise to treat everything you say with utmost confidentiality.

Name of the group.....Estate.....

QUESTIONNAIRE FOR SELF HELP GROUPS AND MEMBERS PARTICIPATION

1. Profile of the group;

- a) When was the group formed?
- b) Is the group registered?
- c) Goals/ objectives of the group?
-
- d) No. of members male female
- e) Activities undertaken by group
-
- f) What is the ratio of men to female and the duration of their stay with the group?
- g) Assets of the group
-

2. Residential solid waste management activities

- a) When did you start engaging in solid waste management?
- b) Why?
- c) Which residential solid waste management activities do you undertake?
- d) Do you get support from any of the following in your solid waste work?

	Agency			Type of support
1.	County government	Y	N	
2.	NGO/CBO	Y	N	
3.		Y	N	
4.		Y	N	

f) What other support do require in order to strengthen your residential solid waste management work?

.....

APPENDIX III

INDEPTH INTERVIEW ON URBAN SOLID WASTE

PARTICIPATION OF WOMEN IN RESIDENTIAL SOLID WASTE MANAGEMENT

My name is Felix Ngugi, a graduate student at the University of Nairobi. I am currently undertaking a study on women participation in Residential solid waste management in this town as part of my Masters Degree academic requirement. I intend to interview you concerning your role in residential solid waste management where your voluntary participation through the responses you give will be highly appreciated. I do hereby promise to treat everything you say with utmost confidentiality.

FOCUS GROUP DISCUSSION GUIDE

1. Is waste handling and disposal a problem in this town?

2. What are some of the problems caused by improper waste disposal?

3. How do you dispose household waste, and in particular what do you do with organic waste materials from the kitchen etc?

4. Do you know the importance of reducing, recycling and re using waste?

b) Do you think there is a potential for composting organic waste in this town?

5. Do you participate in neighbourhood clean up campaigns?
6. Are there SWM self help groups operating in your neighbourhood?
 - b) What assistance do you think such groups would require in order to succeed?
7. Are you members of these self-help groups?
 - b) If yes, what activities do you undertake?
8. Do you encourage children involvement in solid waste management activities in the house hold? Why?