

Factors Influencing the Implementation of Waste Management Projects in Mombasa County, Kenya

¹MARY KAWIRA KITHINJI, ²DR. NDUNGE KYALO

¹Women and Youth Empowerment Training Officer

²Centre for Open and Distance Learning, Masters of Arts in project planning and management University of Nairobi, Kenya

Abstract: The implementation of waste management project has become a problem in Mombasa County. Available information indicate that implementation of projects has been an uphill task, thus the devolution of implementation of projects by the County government. The purpose of the study was to determine factors that influence the implementation of waste management projects in Mombasa County. The results of the study will help the project implementers to learn from the results and help develop knowledge of what will help in future implementation of waste management projects. Factors that were considered under the study included how feasibility study influences implementation waste management projects. This helped the researcher to know whether stalling, incompleteness and un-utilization of waste management project is linked to lack of feasibility study and whether it ascertains project viability and sustainability. Community participation enabled the researcher determine whether there is community involvement in identifying projects that meet their needs. Environmental education was also another variable that was examined. It was to ascertain whether EE to the community is necessary in the implementation of waste management projects. Availability of finance as a factor influencing implementation of waste management projects was also considered. The study used descriptive survey by administering questionnaires which were quick, convenient and cost effective. The data was tested and retested to promote reliability and validity and by working with the relevant professionals of waste management projects and through the guidance of my supervisor. The data was collected from the respondent which was analysed and presented in tables, percentages and statistical figures of central measures of tendency. The findings revealed that, concerning the feasibility study majority of respondents indicated that there is significance influence in implementation of waste management projects. Majority of respondents agreed that there is awareness of solid waste management policies on the community. There was a fair response on level of awareness on conservation on the environment. Majority indicated that source of financing influence implementation of waste management and more so the mode of solid waste management financing. The summary of the test statistic of the feasibility study chi square value is given as $X^2(2) = 11.189, p < 0.05$. For the community participation chi square value is given as $X^2(2) = 14.036, p < 0.05$. For the environmental education chi square value is given as $X^2(2) = 9.203, p < 0.05$. Availability of finance chi square value is given as $X^2(2) = 16.995, p < 0.05$. This indicated that there was significant relationship among the independent variables and the dependent variable.

Keywords: waste management projects, feasibility study, community participation, environmental education and Availability of finance.

1. INTRODUCTION

An effective waste management system is equivalent to good health. If you are lucky to have it, you don't realize it and you think it is how things are and you take it for granted. To the contrary, if things go haywire it is a big problem and everything seems less important. (UN habitat, 2010). The study of waste management has given a lot of in depth knowledge into civilization of yester year. It has been instrumental in solving crimes and even resulted in the fall of an

American president. Human beings are naturally careless with trash and garbiologists have discovered that people let trash fall where it may (Crowell, 2003). Crowel states that there has been a problem of trash from man's earliest time. The four basic means of dealing with waste for both liquid and solid waste has been used over and over in history. i.e burning, dumping, waste minimization and recycling.

According to Crowell (2003) found that it was not uncommon for Europeans to throw their garbage and even human waste out of the window arguing that stray dogs would eat what was thrown out of the window. Over the years increased human activities due to industrialization has created enormous waste. The methods used to collect, store and dispose these has posed a great risk to the environments and public health. The problem of waste management is in the rise in urban centers. Appropriate liquid waste management (LWM) and solid waste management (SWM) are paramount to ensure healthy living conditions for the populations (Christian Zurbrug, 2003).

Inadequate waste management creates serious environmental problems that are detrimental to human and animals and also cause serious and other welfare losses. Inadequate waste disposal causes environmental degradation by contaminating the surface and ground water through leach-ate, air pollution by burning of waste and the waste provide a breeding ground for vectors such as birds, insects and rodents that aid in spreading of deadly diseases. The environment is also degraded by uncontrolled release of methane by anaerobic decomposition of waste (Christian Zurbrugg, 2003). Kungs Kulniti 1990 and Lohani 1984 states that throughout the cities the people that suffer most from the life threatening conditions as a result of deficient waste management is the urban poor. This is because the Municipal government/authorities tend to allocate the scarce financial resources to the rich areas where taxation is high and where citizens with more political power reside. Normally wealth residents avoid direct exposure to the problems of environmental degradation by using part of their income.

Historical human and societal development has resulted in the invention of waste management to cater for emerging needs. For instance in the yester years the concern of the environment were a non-issue, but in the modern age environmental concern are a core concern as governments have to conform to current advocacy called for by environmental conservationists and sustainability. There has been worldwide concern over the impact of inadequate waste management and the degradation of the environment and a massive lobbying has been witnessed globally in safe disposal and recycling of habits of waste. This has resulted to the growth of sub industries of western management in today's society (Hounsell, 2004).

In comparison to traditional societies, today the society is faced with an enormous challenge in the most appropriate method to manage waste. The challenge is in the rate of increase in waste creation as societies develop towards a proactive capitalism. Traditionally, the amount of waste generated was meager due to low population density and low level of exploitation of natural resources by nations. Some nations seem to have had more waste output, depending on the waste management systems in place during an era, the type of technology and the knowledge they had based on adequate waste management habits. Some societies like the Maya of Central America had a fixed monthly ritual where people of one village gathered together and rubbish was destroyed in large dumps by combustion. Research reveal that there is an increase in consumption habits which is characterized by the modern consumer's lifestyle and the growth of industrialization is producing more amounts of liquid waste (LW) and solid waste (SW). The growths in population, wealth and consumerism indexes throughout the world has led to an increase of waste generation per capita (Hounsel, 2014)

Effective waste management largely emphasizes social development aspects that are important to human development and sustainability. Traditionally waste of products was of minimal relevance to societies in comparison to modern society where recycling and conservation habits are now broadly embraced. The problem of waste is now being solved by adopting approaches where waste is used as an input in the production of other products. This approach makes waste management a true profit venture. (Pitchel, 2005). Pitchel acknowledges that through an effective policy and practice of waste management, waste can be a valuable resource. Rationality and consistency of waste management provides an opportunity to gain a range of benefits which include economic, social, integration of equity and environmental benefits.

Globalization has influenced the consumption pattern which has extended the problem of waste to Africa. Africa is the least developed region in terms of urbanization in comparison to other parts of the world. Africa has a development of approximately four percent per annum, and this has resulted to huge amount of Municipal solid wastes. (MSW) and Municipal Solid Liquid Waste (MLW) which has directly affected the safety of human health and environment (Leton and Omotosho, 2004). In Kenya, the problem of waste management lies in the inability of both the local and the central government to collect all the waste generated by the population. As the urban population in Nairobi and elsewhere in East

Africa grows, the bigger the solid waste management burden. – a situation that has been made worse by poor funding for urban sanitation departments and lack of enforcing sanitation regulation (Nairobi, 13 March 2016 IRIN).

Plastics have become a major cause of unmanageable waste that has seen the ban the use, manufacturer and importation of the plastic bags for packaging by the CS for environment on March 2017. It is believed that the move will see the eradication of the plastic bags waste. This will reduce the environmental degradation and play a critical role in fostering clean and healthy environment for all (Wakhungu, 2017;NEMA).

Both liquid and solid waste has been a major threat to public health and environmental degradation in Mombasa County. In Mombasa County just like other urban centers, waste generation has enormously increased, but not with any effort to increase the appropriate technology to deal with the management. With the increased capacity of waste, Mombasa is the second largest city after Nairobi and it has a population of over 800,000 people, producing 750 tons of waste daily. According to a recent study done only a small portion of this waste is collected for safe disposal at the Mwakirunge dumpsite. The rest of the garbage ends up in illegal dump sites.

As mentioned above only a small portion of the waste in Mombasa County approximately 20% is disposed of at the Mwakirunge dumpsite. This means that 80% of the waste is uncollected or illegally dumped within the town or residential areas. The uncontrolled dumping of waste and burning are some of the common practices of disposing waste in Mombasa County. This results in serious pollution of the environment. Mombasa County is characterized by open dumpsites which pose a threat to the environment Roussel (2012)

Currently community based organizations (CBOS) in Mombasa County comprise of youth and women have started projects where they have joined efforts to convert garbage collection into livelihood business ventures. The CBOs compose the waste into organic fertilizers which encourages organic farming, recycling plastics and making charcoal briquettes thus providing an alternative cheap energy source. The government has also donated a four acre plot in Jomvu Kuu areas of Changamwe where a multi-million waste recovery and recycling plant is under construction. Another initiative by the Mombasa County government to solve the challenges of waste management is the Bamburi Cements Ksh. 4.8B partnership with Mombasa County on solid waste management. The partnership deal will help in developing a cost effective and environmentally friendly waste management system in Mombasa County.

The partnership will see Bamburi Lafarge and development partners invest Kshs. 2.8 Billion in financing a feasibility study and providing expertise and equipment to help the Mombasa County Government waste management capacity. Kshs. 2 Billion will be in kind equivalent to the value of the kind that will be provided for the handling of the waste. The waste will be used to generate alternative fuel for the manufacture of cement.

Statement of the Problem:

The estimation of waste generated by Mombasa County is approximately 750-800 tonnes per day. Currently the waste collected is 20% and this means the other 80% ends up being burnt or thrown on the street finding its way to the sea shore and open grounds. This is a major concern due to the rising population and increase in consumption patterns. The major problem is despite the fact that Mombasa is the gateway of Kenya's tourism industry which is a "hot bed of attraction" is also a "hot bed of garbage". Which definitely is not economically making sense. In addition inappropriate methods of waste management like burning of plastic produce toxic smoke or fumes which is detrimental to public health and also degrading the environment (Mwesigye et al 200). There has been a lot of pressure on the county government in regard to the ugly mountains of trash that lie both in town centre and residential areas. The County government has come under attack to deal with the trash issue before any development agenda. For a long time several research have been done on waste management. Despite so many research on waste management, most of the projects have stalled and become 'white elephants' over the years. This is as a result of factors influencing the implementation of waste management projects not being documented. Documenting the factors that influence implementation of waste management projects will help in determining why garbage disposal is still a menace, why waste management projects are not sustainable and the most influencing factor in implementing waste management projects.

Therefore, due to the shortcoming in implementation of waste management projects the researcher finds it necessary to carry out a study of the factors influencing implementation of waste management projects at the County level and gather information that will be used in implementing waste management in future.

Purpose of the Study:

The purpose of the study was to determine factors influencing implementation of waste management projects in Mombasa County.

Objective of the Study:

The study was guided by the following objectives.

- i) To determine how feasibility study influences the implementation of waste management projects.
- ii) To examine the extent to which community participation influences implementation of waste management projects.
- iii) To ascertain how environmental education to the community is necessary in the implementation of waste management project.
- iv) To establish how availability of finance influences implementation of waste management projects.

2. LITERATURE REVIEW

Feasibility Study and Implementation of Waste Management Projects:

A feasibility study is a preliminary study undertaken to determine and document project viability and sustainability i.e the discipline of planning, organizing and managing resources to bring about successful completion of specific project goals and objectives (Jaffe 1967). Feasibility analysis is another term used to describe the preliminary analysis of an existing system to see if it is worth upgrading all or part. It is after a feasibility study that the contractors of a waste management project make a go/no go decision. The go/no go decision is one of the most critical in project planning as it is the point of no return (Jaffe, 1967). Once the contractors of a waste management project have definitely decided to pursue a project there is usually no turning back as the feasibility study will be a major information source in making this decision. It indicates the importance of a properly developed feasibility study.

According to Jaffe (1967), feasibility study is undertaken during the preparation phase of the project cycle prior to the commencement of the actual implementation. It is analytical and includes recommendations and limitation which are utilized to assist the project decision makers when determining if the project is viable. The process involves the appraising of project or groups of projects then choosing to implement some of them. This is because not all ideas which are suggested for project identification should be subjected to feasibility study since it is expensive and time consuming.

In Africa and other developing countries feasibility study has always been a priority before embarking on a project (waste management project). For example, a project appraisal report (PAR) for the Mozambique, urban drainage and solid waste management reveal that a feasibility study was conducted to make an initial assessment of the situation on the ground. The study detailed a design of a tender document for a priority of an investment of the first 5 years of the 25 years planning horizon. i.e. Sewer Sanitation, Onsite Sanitation, Collection and Disposal of solid waste and drainage system. The phase of the feasibility study of the project also included a reliable and accurate cost estimates and recommendation for implementations, mitigation of environmental and social impacts and institutional requirement and tariff setting for sustainability.

In Kenya a feasibility study done by (Rotich & Sheng, 2005) on the challenges affecting municipal solid waste management, reveal that poor waste management was a result of low income in developing countries. Challenges of poor economic growth have also resulted to the poverty level which by then stood at 56%. The feasibility study also revealed that political interference was also a hindrance to the smooth running of the local authorities.

A feasibility study also conducted by National Environmental Authority (NEMA) on the environmental pollution through uncontrollable disposal of waste tyres, has raised concern on appropriate disposal of tyres by various stakeholders. As a result of the feasibility study, currently there is a waste tyre management partnership between Bamburi cement, road transport businesses in Kenya and GIZ. This partnership is led by Bamburi cement which is a subsidiary of Lafarge ecosystem. The waste tyre management team deals with the feasibility studies, financial, environmental, social and technical issues. Therefore before investing in a proposed project one must determine whether the project is economical, viable and the investment advantages outweigh the risks involved (Matson, 2000). Most projects are quite expensive to conduct and it also involves unfamiliar risks.

Community Participation and Implementation of Waste Management Projects:

A community is a term used to describe people living together in some form of social structure and cohesiveness. Its members tend to share a great deal of political, economic, social and characteristics as well as interests. The definition of 'participation' is a matter on which there is a considerable disagreement among development scholars and practitioners. Some use the term to mean active participation in political decision making. For certain activists' groups, participation is

meaningless unless the people involved have significant control over the decisions concerning the organization to which they belong. Development economists tend to define participation by the poor in terms of the equitable sharing of the benefits of projects. Others view participation as an instrument to enhance the efficiency of projects or as a co-production of services. Some would regard participation as end to itself, whereas others see it as a means to achieve other goals. These diverse perspectives truly reflect the differences in the objectives for which participation might be advocated by different groups (World Bank experience).

Community participation is an interactive process that entails communication, listening, consulting, collaborating and merging with the community who acts as a partner and will participate to give consent and opinion regarding the decision making process (Okello et al., 2009). Community participation involves information sharing, empowering the community in terms of ability to influence the decision making process by involving them in decision making processes and taking into consideration the ideas generated by the community (Gozun, 2008)

Community participation in implementation of waste management projects is vital for several reasons. The first rationale is that the community will have responsibility to participate as it is a fact that everyone in a community generates waste and community members can be affected either directly or indirectly if waste is not managed well. The role of community participation in a waste management is that it ensures sustainability of the project by welcoming them. People know when they are welcome and when they are not. Welcoming community participation means more than giving a new participant a friendly smile and supporting them. When people are not welcome they will not stay for long. The success of community participation in implementation of waste management projects requires opening the process to the new comers and involving them actively in participating in the project at hand (Reid. 2000). This can be by the following gesture:-

The role of active participation of the community in issues of waste disposal especially in urban areas means involving key actors in various institutions in the participation process. These actors include district committee, NGOs, local authorities and business women associations. Traditional rulers, teachers, politicians, teacher's district heads, religious leaders and youths are actors in playing a role in community participation to implement waste management projects. (Syagga, 1992) is in support of the community sector actively involving itself in providing the solutions to the urban poor including waste management. Karanja (2005) acknowledged the efforts of the community sector in Nairobi, such as the charitable organization, tribal association or professional support, NGOs, welfare groups, village committee. Self-help groups and security committee providing waste management services. Despite the contest that some authors argue that community participation makes no difference in project implementation, the importance of community involvement in project implementation and especially those projects that affect them directly is well established in literature (Chamala, 1995). Community participation will enhance project viability and sustainability through community ownership (Kelly & Vlaenderen, 1995). Therefore the researcher will embark on establishing the role of community participation in implementation of waste management project.

Environmental Education and Implementation of Waste Management Projects:

Environment is the total sum of conditions and influences that affect the way things live and develop. Things in this case refer both the living and the non-living part of the environment. Thus environmental education is the process that allows human beings to explore issues affecting the environment engage in coming up with solutions to the problems affecting the environment and with the awareness and knowledge and take appropriate action to improve the environment. Environmental education enables individuals to develop a deeper understanding of the environmental challenges and have the skills to make informed and responsible decisions (United States Environmental Protection Agency (USEPA). There are five components of environmental education and they include: - Sensitivity and awareness to environmental issues and challenges, information and understating on the environmental issues and challenges, attitudes to show concern for the environment and motivate individuals to maintain or improve environmental quality, skills that help and identify solutions to environmental challenges and participation in activities that lead to solutions of problems affecting the environment.

Availability of Finance and Implementation of Waste Management Projects:

Availability of finance in project implementation means there is enough cash to procure the resources needed for the waste management projects. When finance is available waste management projects will be quickly implemented and thus projects will be completed in time thus preventing project overruns. Project financing is of three types – short term, medium term and long term financing. When finance is not available delayed payment to people working on the projects could stall the project and reduce the team synergy toward achieving the objective of the project. (Fernando Vincent,

1965).The financing of a project is possible through various participants or stakeholders who have role to play in the project

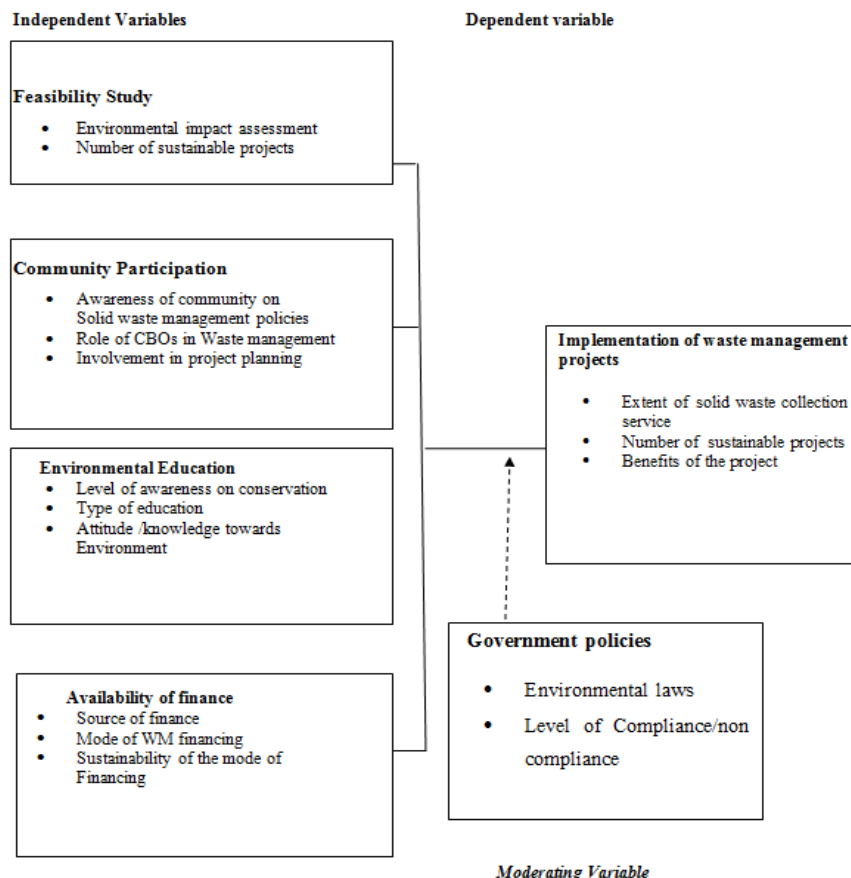
Availability of finance is key in implementation of not only waste management projects but any other project. This is because money is constantly required by the contractor undertaking the project to pay for materials, labour, plant, sub-contractors, preliminaries and general overheads expended during the progress of the work (Odenyika & Yusuf, 1998). The disruption of the flow of cash caused by lack of finance can significantly affect the daily operations of small projects (Coy, 2006). This imply that for successful implementation of projects, advance capital funding for the works by overdrafts, trade, credit or other interim means as the work progress become unavoidable (Cheng and Gary, 2002). They further advocate that the toil and the sweat of workers usually provide a significant contribution to the capital that has to be advanced for the completion of the works. As a result contractor at all levels become unsecured creditors waiting for interim payment usually two months after the work has been done or materials supplied. Uninterrupted cash flows become vital to the survival of the workers and contractors (Cheng and Gary 2000)

While those could be the findings for the case of waste management in India, South Africa and developing countries, this study will seek to establish whether availability of finance influence implementation of waste management projects in Mombasa County. Already an initiative is on course by Kenya Marine and Fisheries Institute (KMFRI) resource centre have come with a program for Kenya Coastal Development Project (KCDP) or the so called ‘Hazina ya Maendeleo ya Pwani’ (HMP) Under this initiative CBOs have been offered grants to implement various projects. The projects that have benefited include solid waste management projects. Already literature reviewed indicates that so far KCDP has awarded Kshs. 48 million to CBOs. Thus the research will establish whether there are enough funds allocated by Mombasa County for implementation of projects and if availability of funds increases the chances of successful implementation of such projects.

The Conceptual Framework:

A conceptual framework is a model that illustrates the independent variables understanding and their relationship on the independent variable (Mugenda & Mugenda 2003)

Conceptual Framework



3. RESEARCH METHODOLOGY

Research Design:

The research design that was employed in this study was descriptive survey. The study used a positivist approach where quantitative and qualitative analysis was employed. In this research, various respondents who play key roles in implementation of waste management projects were identified. Their responses were assigned figures which were analyzed statistically to come up with findings and recommendations.

Target Population:

Target population is a set of people or objects that the researcher used to generalize the results of the research (Borg and Gall, 1989). The research was undertaken in Mombasa County. Mombasa County has four sub-counties i.e. Kisauni, Mvita, Changamwe and Likoni. There are over fifty waste management projects in operation with approximately over 939,370 stakeholders involved directly or indirectly in implementation of waste management projects. The researcher concentrated on 1400 stakeholders who are involved directly by ten waste management projects that are registered and operational

Sampling Size and Sampling Procedure:

The researcher used random sampling and purposive selection of the samples. In correlation studies, 30 cases or more are required while for descriptive studies, 10% of the accessible population is adequate (Mugenda & Mugenda 2000). According to Mugenda & Mugenda (2009), a sample size of 10-30% of the target population is adequate to represent the entire population for research analysis, thus in this study a sample size of 10% represented the population. The sample size of this research study consisted of 140 respondents. 120 of who were community who benefited from the waste management projects. They included self-help groups, key business and institutions, local private waste companies and a few selected households. The other 20 respondents were key informants who were purposefully selected. They included Nema officials, CBOs, NGOs and Project managers of the waste management projects.

Data Collection Instruments:

The study collected information using questionnaire and document analysis as the main tools of collecting data. The questionnaires were used to obtain information from those who are directly involved in implementation of waste disposal projects as well as those who are affected by poor management of waste and those people concerned with sustainability of the environment. Information was also collected from the beneficiaries of waste management projects. The data was collected using both qualitative and quantitative approaches. The researcher chose to use questionnaires because they are quick and the respondent can complete them at his/her own convenient time. They can be used to reach more people and save time especially when they are mailed to the respondent. Document analysis which is a form of qualitative research was used by the researcher to analyse the response to give voice and meaning of the research. Using both qualitative and quantitative approaches helped in easy interpretation of data both to the mathematical and non-mathematical person.

Data Collection Procedure:

The study was carried out using questionnaires and document analysis as the main tools for collecting data. The researcher made adequate preparation to inform the respondent which increased the chances of successful interview especially with the key stakeholders namely the community (Beneficiaries of the waste Management project)s, NEMA officials, the CBO'S, NGO'S and Project managers of the waste Management projects. The researcher commenced the process of data collection after approval of the research proposal by the supervisor. The letter of transmittal, was issued by the university to facilitate issuance of the research permit by the county government and the relevant authorities. Given the go ahead, the researcher embarked to undertake the research by collecting data, by presenting the permit to the concerned authority. The authorities include Mombasa County Government NEMA officials, CBOs, NGOs, Project Managers and the selected community beneficiaries of waste management projects.

Data Analysis :

Quantitative and qualitative data was obtained from prepared questionnaires. The questions in the questionnaires had three types of answering methods namely: Rating based method, selective based and open formats. For the rating based questions the statement were devised to measure the respondent's opinion by registering them on a five point scale ranging from 'excellent' to 'below average' and 'strongly agree' to 'no opinion'. The selective based questions only

required the respondent to tick the appropriate box or boxes in the questionnaire. The open based format will allow the respondent to record their own answers to the questions. The data was further analyzed used descriptive statistics and measure of central tendency using SPSS.

4. DATA ANALYSIS, PRESENTATION AND INTERPRETATION

Questionnaire Return Rate:

The research study sampled questionnaires to 140 respondents. There was a response of 112 questionnaires from the total sampled respondents. This represents a response rate of 80% which in social research is an accepted statistic. There were 120 community beneficiaries out of which 98 respondents responded to the questionnaires. This represents an 81% questionnaire return rate. The key informants who were purposefully selected were 20 out of which 14 responded, which represents 70% of the selected respondent.

Demographic Characteristics of Respondent:

The researcher summarized the education background of the respondent in three levels. That is primary education, secondary and tertiary education. Tertiary education included all respondents with a diploma, bachelor's degree and post graduate degree from any college or university. The demographics on educational level indicate that a majority of the respondents 67.8% have acquired a university degree or a college diploma. 26.7% have an O level certificate. They included beneficiaries of waste management projects which included members of self-help groups, private waste collectors and a few selected households. 6.1% have attained primary education. Those with tertiary education comprised of 67.8% of the respondents and it is due to this fact that the results of this research study are significantly valid because majority of the respondents understands the implementation of waste management projects.

Feasibility Study and Implementation of Waste Management Projects:

In regard to feasibility study, the study sought to establish the views of the respondents as to the indicators of feasibility study. The mean and standard deviation of the responses were established. From the findings majority of beneficiaries 86% with a mean and standard deviation of 4.47 and 1.0843 respectively said feasibility study has a significance influence in implementation of waste management projects, 93% said environmental impact assessment has a significant role in implementation of waste management projects with a mean and standard deviation of 4.24 and 1.0274 respectively and 78% said coordination of the feasibility team and the community influences implementation of waste management projects in a greater extents with a mean and standard deviation of 4.24 and 1.0274 respectively. For the key informants, 82% with a mean and standard deviation of 4.71 and 1.1225 respectively said that feasibility study has a significance influence in implementation of waste management projects, 79% of the respondents said environmental impact assessment has a significant role in implementation of waste management projects with a mean and standard deviation of 4.13 and 1.0012 respectively and 76% of the respondents said coordination of the feasibility team and the community influences implementation of waste management projects in a greater extent with a mean and standard deviation of 4.01 and 1.0032 respectively. This may be an indication that feasibility study manages waste implementation effectively and efficiently. Thus, policies should be formulated and enacted to support the same. The study sought to determine the NEMA feasibility study on implementation of waste management projects. Majority of the respondents strongly agreed that feasibility study is a vital in waste management project in Mombasa County. Also, most of them agreed in great extent that environmental impact is necessary during a feasibility study.

Inferential Statistics was carried out by use of Pearson Chi-Square analysis at 95% confidence interval and 5% significance level and was a 2-tailed test. The results showed that the null hypothesis stating that there is no relationship between feasibility study and implementation of waste management projects was rejected and the alternative hypothesis stating that there is a relationship between feasibility study and implementation of waste management projects was accepted. The summary of the test statistic of the output is given as $X^2(2) = 11.189$, $p \leq 0.05$. This shows that there is statistically significant relationship in the feasibility study and implementation of waste management projects in Mombasa County.

Community Participation and Implementation of Waste Management Projects:

In regard to Community participation, the study sought to establish the views of the respondents as to the indicators of Community participation on implementation of waste management projects. The mean and standard deviation of the responses were established. The findings show that majority of beneficiaries 82% agreed that there is awareness of solid

waste management policies on the community it also had a mean and standard deviation of 4.22 and 1.1483 respectively, 87% of the respondents said there is a significant role of CBOs in solid waste management, 78% agreed that there is involvement of the community in project planning with a mean and standard deviation of 3.81 and 0.9238 respectively, 76% of the respondents said there is necessary for openness and transparency in enhancing community participation with a mean and standard deviation of 3.92 and 0.9502 respectively, 71% with a mean and standard deviation of 4.23 and 1.1543 respectively of the respondents said there is necessary for capacity and training programs to empower community participation and 82% with a mean and standard deviation of 4.24 and 1.0274 respectively of the respondents said clarity of each stakeholders role is necessary in enhancing community participation. For the key informants, findings show that majority 94% agreed that NEMA enhances awareness of the community on solid waste management policies with a mean and standard deviation of 4.31 and 1.1354 respectively, 79% with a mean and standard deviation of 4.17 and 1.0113 respectively of the respondents said there is enhancement in the role of CBOs in solid waste management, 60% agreed that there is enhancement of community involvement in project planning with a mean and standard deviation of 4.05 and 1.0082 respectively, 99% with a mean and standard deviation of 3.95 and 1.2224 respectively of the respondents said the level of awareness on conservation is adequate, 89% of the respondents said it is vital in implementation of waste management project with a mean and standard deviation of 4.47 and 1.0843 respectively and 69% of the respondents said policy on environmental laws is vital in implementation of waste management project with a mean and standard deviation of 4.12 and 1.0178 respectively.

Inferential Statistics indicates that there is statistical relationship between the Community participation and implementation of waste management projects. The data above was analyzed using a chi square goodness of fit test in order to test the significance. The results showed that the null hypothesis stating that there is not relationship between community participation and implementation of waste management projects was rejected and the alternative hypothesis stating that there is a relationship between community participation and implementation of waste management projects was accepted. The summary of the test statistic of the output in table 4.6 is given as $X^2(2) = 14.036$, $p \leq 0.05$. This shows that there is statistically significant relationship in the 14.036 and implementation of waste management projects in Mombasa County.

The respondents were also asked if there was any non-compliance of the policies in regard to community participation. The findings represented shows that 49.1% of the respondents said no whereas 43.1% said yes. Therefore, majority of the NEMA respondents were not aware of Non-compliance of the policies in regard to community participation.

Environmental Education and Implementation of Waste Management Projects:

In regard to environmental education, the study sought to establish the views of the respondents as to the indicators of environmental education. The mean and standard deviation of the responses were established. The findings show that majority of beneficiaries 69% with a mean and standard deviation of 4.11 and 1.1538 respectively agreed that the level of awareness on conservation influence implementation of waste management project at a great extent, 67% of the respondents said there is no significant implementation of environmental laws by the government with a mean and standard deviation of 2.81 and 2.9238 respectively but there was a significant percent of 33% which agreed that environmental laws by the government are effective, 91% agreed that there is a good attitudes towards the environment, 66% with a mean and standard deviation of 4.29 and 1.0592 respectively of the respondents said it is necessary for adopting of policy and regulatory framework on implementation of waste management project, 71% of the respondents said contributes to the improvement on community behavior towards the environment is necessary with a mean and standard deviation of 3.93 and 1.2243 respectively and 91% with a mean and standard deviation of 4.23 and 1.1565 respectively of the respondents said the type of education influence the environmental education to the community. For the key informants, findings show that majority 68% with a mean and standard deviation of 4.18 and 1.1435 respectively agreed that the level of awareness on conservation influence implementation of waste management project at a great extent, 66% with a mean and standard deviation of 3.17 and 2.3123 respectively of the respondents said there is significant implementation of environmental laws by the government are effective, 72% agreed that there is a good attitudes towards the environment with a mean and standard deviation of 4.13 and 1.1082 respectively, 93% with a mean and standard deviation of 4.05 and 1.0024 respectively of the respondents said it is necessary for adopting of policy and regulatory framework on implementation of waste management project, 90% of the respondents said contributes to the improvement on community behavior towards the environment is necessary with a mean and standard deviation of 4.07 and 1.1348 respectively and 75% of the respondents said the type of education influence the environmental education to the community with a mean and standard deviation of 4.18 and 1.1871 respectively.

Inferential Statistics was carried out and the data above was analyzed using a chi square goodness of fit test in order to test the significance. The results showed that the null hypothesis stating that there is not relationship between Environmental education and implementation of waste management projects was rejected and the alternative hypothesis stating that there is a relationship between Environmental education and implementation of waste management projects was accepted. The summary of the test statistic of the output in table 4.9 is given as $X^2(2) = 9.203$, $p \leq 0.05$. This shows that there is statistically significant relationship in the 9.203 and implementation of waste management projects in Mombasa County.

Availability of Finance and Implementation of Waste Management Projects:

In regard to availability of finance, the study sought to establish the views of the respondents as to the indicators of availability of finance. The mean and standard deviation of the responses were established. The findings show that majority of beneficiaries 76% with a mean and standard deviation of 4.01 and 1.2158 respectively agreed that the source of financing influence implementation of waste management project at a great extent, 57% of the respondents said the mode of solid waste management financing influence implementation of waste management project with a mean and standard deviation of 3.71 and 1.2938 respectively but there was a significant percent of 43% who had a contrary opinion, 81% with a mean and standard deviation of 4.32 and 1.1592 respectively agreed that sustainability of the mode of financing influence implementation of waste management project, 66% with a mean and standard deviation of 4.23 and 1.1243 respectively of the respondents said there are inadequate sources of financing, and 67% of the respondents said increased reduction by the national government on allocation of funds to the County government influence implementation of waste management project with a mean and standard deviation of 3.94 and 1.2474 respectively.

Inferential Statistics was carried out and the data above was analyzed using a chi square goodness of fit test in order to test the significance and the output is presented in table 4.11. The results showed that the null hypothesis stating that there is not relationship between availability of finance and implementation of waste management projects was rejected and the alternative hypothesis stating that there is a relationship between availability of finance and implementation of waste management projects was accepted. The summary of the test statistic of the output in table 4.11 is given as $X^2(2) = 16.995$, $p \leq 0.05$. This shows that there is statistically significant relationship in the 16.995 and implementation of waste management projects in Mombasa County.

5. SUMMARY OF FINDINGS, CONCLUSIONS, AND RECOMMENDATIONS

Summary of Findings:

The study involved four independent variables which included feasibility study, community participation, environmental education and availability of finance. The dependent variable for the study was implementation of waste management projects. A total of 140 questionnaires were issued to respondents, out of this 112 were filled and returned bringing a response rate of 80%. 59% of the respondents were male while 41% were female. This indicated an even distribution of the respondents by gender. The study provided a summary of the findings in tandem with the research objective.

Descriptive statistics showed that the respondents agreed with most of the aspects of feasibility study giving a mean average and standard deviation of approximately 4.28 and 1.042733 respectively (agree) in their responses. This meant that the respondents felt feasibility study being of great importance on implementation of waste management. Concerning the feasibility study majority of respondents indicated that there is significance influence in implementation of waste management projects. The findings indicates that environmental impact assessment has a significant role in implementation of waste management projects. Coordination of the feasibility team and the community influences implementation of waste management projects in a greater extent.

The respondents further denied being involved in the implementation of waste management projects. They agreed with most the aspects of community participation on implementation of waste management projects indicating means average and standard deviation of approximately 4.15 and 1.062408 (agree) respectively. Majority of respondents agreed that there is awareness of solid waste management policies on the community but there was a significant percent who were not aware and this indicates that there is need for the sensitization of the community on solid waste management policies. Most of the respondent agreed that CBOs plays a vital role on solid waste management. A good number agreed that there is involvement of the community in project planning but there is a need for openness and transparency in enhancing community participation, capacity and training programs to empower community participation and clarity of each stakeholder's role is necessary in enhancing community participation.

Most of the respondents agreed with the aspects of environmental education giving mean average and standard deviation of approximately 3.95 and 1.369442 (agree) respectively. This was an indication of there is need of more environmental education practices in the implementation process. There was a fair response on level of awareness on conservation on the environment, but majority said that there is no significant implementation of environmental laws by the government. Most agreed that there are attitudes towards the environment and they indicated that it is necessary for adopting of policy and regulatory framework on implementation of waste management project. Contributes to the improvement on community behavior towards the environment is necessary as most indicated it's a major concerns and it depends the type of education and this will influence the environmental education to the community.

Descriptive statistics indicated that the respondents agreed with all the aspects of availability of finances having average means and standard deviation of 4.067 and 1.17785 respectively (agree). They disagreed that community members are involved in monitoring of projects. Majority indicated that source of financing influence implementation of waste management and more so the mode of solid waste management financing. Sustainability of the mode of financing was a major concerns to most respondents. Inadequate sources of financing was seen as major aspect of implementation of waste management projects. It was also noted there was increased reduction by the national government on allocation of funds to the County government thus influencing implementation of waste management project

Conclusions:

The purpose of this research was to determine factors influencing implementation of waste management projects in Mombasa County. The analysis of the data collected led to the following conclusions: The summary of the test statistic of the feasibility study chi square value is given as $X^2(2) = 11.189$, $p < 0.05$. This shows that there is statistically significant relationship in the feasibility study and implementation of waste management projects in Mombasa County. Thus it is necessary to conduct a feasibility study before embarking on implementation of waste management project. For the community participation chi square value is given as $X^2(2) = 14.036$, $p < 0.05$. This shows that there is statistically significant relationship in the 14.036 and implementation of waste management projects in Mombasa County. For waste management projects to have a continuing impact, community participation is a precondition and this entails involving the community at different stages and degrees of intensity in the project cycle. For example, community members can participate in different ways, such as paying collection fees, offering waste at the appropriate time and separating recyclable materials. For the environmental education chi square value is given as $X^2(2) = 9.203$, $p < 0.05$. This shows that there is statistically significant relationship in the 9.203 and implementation of waste management projects in Mombasa County. Thus environmental education is vital in implementation of waste management project. Availability of finance chi square value is given as $X^2(2) = 16.995$, $p < 0.05$. This shows that there is statistically significant relationship in the 16.995 and implementation of waste management projects in Mombasa County. The study was critical in relation to formulating policies and implementation of waste management project in the country. The findings will provide benchmarks upon which stakeholders in waste management can borrow to re-evaluate strategies and approaches in order to enhance implementation of waste management project

Recommendations:

1. There should be coordination between the feasibility team and the community involving opinion leaders and local authority before implementation of waste management project
2. There should be more community involvement which entrenches openness and transparency by the waste management projects implementers on the roles of community and involve them in the project implementation committee (PIC).
3. There is need for environmental education programmes at different level of community, empowerment and capacity buildings programmes on importance of conservation of environment.
4. The existing policy on budgetary resources allocation should be improved and to accommodate transparency and effective utilization.

Suggestions for Further Research:

It was noted that several studies have been carried out on waste management system but few on implementation on waste management projects and why waste continues to be a menace in most counties especially Mombasa in various counties. Further research study is recommended on the challenges facing implementation waste management project.

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AUTHOR'S BIOGRAPHY:

Mary Kawira was born in the 70,s Eastern part of Kenya in Meru County. Mary is a wife and mother of 4 kids. After O – level Mary joined the Kenya Utalii College and graduated with an Associate Diploma in Tour Guiding and Administration. In the mid 90’s worked as multilingual French, German and English Tour Guide with private Safaris East Africa LTD, Mary has been also involved in various training programs in the hospitality industry such as customer care front office and public relations.

Mary enrolled for a Diploma in Public Relations in 2010 at the University of Nairobi and later Bachelors of Arts in Project Planning and Management. Currently she is looking forward to graduate with a Master of Arts in Project Planning and Management. Mary is engaged in women and youth empowerment programs and is also member of Toast master’s public speaking club and also a chairlady Christian education PCEA church at parish level. She loves reading, writing and family care.