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# DETERMINANTS OF IMPROVED SOLID WASTE MANAGEMENT: A CASE OF MOMBASA COUNTY, KENYA

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***Abstract:*** **Solid waste management is meant to ensure that the processing of solid waste materials is due in a way that best addresses the range of public health, aesthetics, conservation and other environmental considerations. Municipalities are spending significant resources to address this problem, but the overall situation is far from satisfactory and rapid and haphazard urban growth is making the problem worse. The purpose of this study was to establish the determinants of effective Solid Waste Management in Mombasa Municipality, Kenya and explore opportunities for waste reduction and recycling. The study was guided by certain objectives which were: to analyze the degree to which reusing materials contribute towards enhanced strong waste administration in Mombasa County; to survey the degree to which government strategies contribute towards enhanced strong waste administration in Mombasa County; to set up the degree to which education and awareness contribute towards enhanced waste administration in Mombasa County and to evaluate the degree to which public support contributes towards enhanced waste administration in Mombasa County. The investigation was anchored by three hypotheses; stakeholder hypothesis; behavioral finance hypothesis and institutional hypothesis. The investigation received a clear study explore structure. The investigation sample population was 240 respondents overviewed from a populace size of 450 representatives. Illustrative inferential insights which mean, standard and rate were utilized, and tables and figures used to exhibit information. $R^2$ was 0.843 which inferred that there was 84.3% assortment in solid waste management in view of advancement in recycling. The examination found that the association coefficient was 0.918 which indicated that there was a significant relationship between solid waste management and recycling. The study found that recycling when held to an enduring zero then improved solid waste organization would be 1.893. Other than a unit augment in recycling would incite an extension in enhanced waste administration by a factor of 1.242. $R^2$ was 0.875 which implied that there was 87.5% variety in enhanced solid waste management because of progress in government policy. The examination found that the association coefficient was 0.935 which illuminates as such there was sure association between solid waste management and government policy. The examination found that organization approaches when held to a consistent zero then improved solid waste would be 0.176. $R^2$ was 0.769 which inferred that there was 76.9% assortment in solid waste due to advance in education and awareness. The examination found that the association coefficient was 0.877 which elucidates thusly there was sure association between improved solid waste management and education and awareness. The examination found that education and awareness when held to an unfaltering zero then improved solid waste would be 0.556. $R^2$ was 0.729 which inferred that there was 72.9% assortment in upgraded solid waste organization due to advance out in the open participation. The examination found that the association coefficient was 0.854 which illuminates thusly there was certain association between improved solid waste and public participation. The examination found that open help when held to a steady zero then waste management would be 0.667. From the findings of this study, it can be concluded that public participation contributes influences on improved solid waste management, recycling contributes influences on improved solid waste management, education and awareness contributes influences on improved solid waste management, government policy contributes influences on improved solid waste management. The study recommended that for improved solid waste management public participation has to be practiced at all times, recycling should be embraced, education and awareness is paramount especially in processes, training, and equipment used etc. and government policies need to be passed and implemented in good faith.**

***Keywords:*** **Solid Waste Management; Recycling; Government Policies; Education and Awareness & Public Participation.**

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## 1. BACKGROUND OF THE STUDY

Expanded urbanization, which is generally controlled by the outpouring of individuals from heartland searching for better living has its own effect. Expanding waste rate due high masses, changing lifestyles of people, progression and usage of things with materials that are less biodegradable have incited the expanded difficulties in waste taking care of in various urban networks of the world (Asase et al 2009). The rapid growth of the population is creating a natural issue in urban concentrations in both created and creating countries around the world. Accordingly, residential strong waste represents a complex test for ecological strategy. The issue of overseeing strong waste in the urban regions must be found in the more extensive setting of issues caused by fast urbanization. The need to deal with this expanding waste in a naturally compelling, mechanically practical, financially reasonable and socially adequate way is an issue experienced by all countries of the present reality. Waste handling is likewise not a pleasing activity; yet without it, each city would stop to exist (Zurbrugg, 2002). Thus, all urban communities, the world over, have built up some method for managing waste handling.

In most developing nations, normally not over sixty percent of waste produced is not gathered (Zerbock, 2003). Subsequently, the uncollected waste is dumped pointlessly in the streets and in channels, adding to flooding, raising of frightening little animal and rodent vectors and the spread of diseases. The condition in Africa, particularly in the capital urban regions is not pleasing. General society in various countries can't pass on advantages enough, control of the private portion is confined and unlawful dumping of nearby and present-day waste is a common practice. All things considered, dissipate is given a low need in these countries.

UN projections measured urbanization rate increment from 24% in 2005 to 38% by 2030, with in excess of 20 million Tanzanians living in urban zones (Barr, 2007). The brisk extending proportions of waste must be readied. In Africa, administration challenge available for this question is routinely poor and inadequate, especially in low-pay zones. Most city specialists in creating countries have fail to outfit their expanding masses with adequate administration for managing waste and furthermore to give water and sanitation (Abduli, 2007). East Africa and in its capital urban networks particularly, urban waste administration speaks to an authentic normal issue. The rapidly creating measures of family unit waste build up a monstrous test for the close-by pros. With the ultimate objective to upgrade their techniques for regulating private solid waste, a predominant cognizance of both the imaginative and regulatory viewpoints and estimations is required.

For some time, individuals have endeavored to discover a method for discarding their waste (Bassis, 2016). Legitimate dissipate transfer is vital to guarantee everybody's wellbeing from conceivable wellbeing perils. The inappropriate waste transfer of trash is a noteworthy sociological issue today because of its capacity of sullying the zone in which we live and it's capability to be deadly to every single living thing. Its belongings increment the danger of antagonistic wellbeing impacts in people and creatures; makes harm eco-frameworks and quicken the demolition of our condition. The more waste we produce, the more we need to discard. As indicated by (Kimani et, al, 2012), they affirm that Kenya incorporating numerous different nations on the planet is encountering difficulties in waste administration. The difficulties that created and developing countries are looking in waste administration works on, extending from age of waste, partition, accumulation, transport, treatment, reuse and transfer of waste. An author (Otieno, 2010) states that somewhere in the range of thirty and forty percent of waste in urban zones in Kenya is uncollected and fifty of the Kenya people don't have a capable exchange instrument of the waste they make.

Issues affecting waste management in Kenya are similar from town to town. Therefore, general problems undermining efficient waste management practices like in Nairobi County can be extended to a town in Kiambu County. Authors Oosterveer and Mol, (2010) state that the City County lacks adequate and properly trained staff to handle city's waste management processes, and hence vision and goals of the waste handling department within the county cannot be realized. The authors continue to highlight that the department within the county charged with waste management has yet to develop a policy formulation and standardize operational guidelines for the city waste management practices, and as a result, the staff members in the department are ever embroiled in daily crisis management. According to Magutu et al. (2011), the unprofessional manner through which the county handles water management is evident in the collection methods and dumping methods they use, which is mainly door-to-door type. The city council load their waste collection trucks using a manual method that is time consuming and unprofessional. The collected waste is then transported using

open trucks to dumpsites located adjacent to residential areas, posing huge health and environmental risks to the citizens. In addition, the city council has not established formal structures to prevent dumping of hazardous and toxic waste into these dumpsites.

## 2. PROBLEM STATEMENT

Developments from lifestyle changes and subsequent changes in family utilities have made issues in current social condition complex. Throwing of wastes into unpaved streets, roadways and vacant land led to breeding of various insects, rodents and diseases. Lack of proper SWM, that is increased waste volume, improper waste disposure and misuse is one of the new issues in the world, which resulted to epidemic of plague, the Black Death disease that killed half of fourteenth Century Europeans. This prompted the start of public health control measures in the nineteenth century, where food wastes had to be collected and disposed of in a sanitary manner to control rodents and flies the vectors of disease in connection with public health and improper storage of solid wastes. Industrialized nations has argued, to date generates several pounds of solid waste per consumer making the danger of disposed wastes to be twofold, not only directly in the home, but indirectly in factories that manufacture goods purchased by consumers. In response, many cities in the developed nations, have set up County or municipal garbage collections bodies, in the form of rag and bone men, who buy useful garbage from people and recycle it; a quality waste collection team that would dispose unusable waste.

In Mombasa county and Kenya at large, waste collection and transportation is very much informal. Open dumping is the major waste disposal method being employed with very minimal recovery techniques. As a result of the informal dumping recyclables are mixed with other waste both at the household level, industrial level and at the dumpsite. Currently, Mombasa county has developed waste management programs, legislation and policies which have brought a number of positive impacts to the local people. For example, putting up of LED lights and dustbins outside all shops, offices and buildings in town and shopping centers, embracing and emphasizing on waste management lessons and training in school and institution respectively.

Most solid waste pickers in the world are known to die in an alarming rate due to solid waste pollution related diseases and the enticing demand in solid waste picking is still on increase. Wastes in general continues to increase daily along with the related risks, however, as it stands to date not much has been done, in terms of research study, to unveil what contributes to all these, human solid waste related risks among the society. Nevertheless, researches so far done, have concentrated on solid waste management and practices, focusing on re-use, recycle and reduce (3R), a concept adopted by the Japanese industries, that does not take care of risks involved in the whole venture.

However, serious research study on solid waste projects, collection, dumping, recycling and reuse habits to investigate their related effects are so far lacking, the results of which is the witnessed related risks and consequent death to most of the project's workers. In addition, the developed world's solid waste workers are also languishing in Greenhouse gases (GHG) impacts that cause death and other health problems to the entire human society. Therefore, aroused by such like study gaps in this societal human ingredient, the researcher carried out a study to investigate the determinants of risk in solid waste management projects in Kenya, in relation to legal framework, technology, personnel skills and policy, assumed to influence risk in solid waste management projects, with particular interest in Mombasa County, and hence bridge the gaps.

## 3. PURPOSE OF THE STUDY

The purpose of the study was to examine determinants of improved solid waste management: A case of Mombasa County, Kenya.

### 3.1 Objectives of the Study:

This study was guided by the following four objectives;

1. To examine the extent to which recycling contributes towards improved solid waste management in Mombasa town.
2. To assess the extent to which county government policies contributes towards improved solid waste management in Mombasa town.

3. To establish the extent to which education and awareness contributes towards improved solid waste management in Mombasa town.

4. To assess the extent to which public participation contributes towards improved solid waste management in Mombasa town.

## 4. RESEARCH HYPOTHESES

The study tested the following hypothesis at the 95% level of significance:

1. $H_a$: There is a significant relationship between recycling and improved solid waste management.
2. $H_a$: There is a significant relationship between government policies and improved solid waste management.
3. $H_a$: There is a significant relationship between education and awareness and improved solid waste management.
4. $H_a$: There is a significant relationship between public participation and improved solid waste management.

## 5. LITERATURE REVIEW

### 5.1 Theoretical Framework:

According to Creswell (2009), the theoretical framework is defined as the presentation of a theory that explains a particular problem. It identifies a plan for investigation and interpretation of the findings. This study employed the following theories;

#### *5.1.1 Stakeholder Management Theory:*

In their recommendation of the hypothesis, Jones and Wicks (1999) started by sketching out the essential space of partner administration hypothesis. The fundamental premises of partner administration hypothesis are that the enterprise has associations with numerous constituent gatherings "partners" that effect and are influenced by its choices, the nature of these connections impacts the firm and its partners and the interests of every single (real) partner have inborn esteem. Likewise, the hypothesis expresses that no arrangement of interests is accepted to command the others and the hypothesis centers on administrative basic leadership, Howell et, al., (2015). Thusly, partner hypothesis shows that associations do expressly deal with their associations with various partner gatherings. Getz and Timur (2012) point out that in spite of the fact that this is expressively valid; associations seem to oversee partners for both instrumental reasons and, at the center, standardizing reasons. Jensen (2010) imagines partnerships as in a general sense social, which is, as an arrangement of essential partner gatherings, an intricate arrangement of connections between and among intrigue bunches with various rights, targets, desires and duties.

The partner idea can be a helpful apparatus in strong waste administration in Mombasa town. Specifically, the procedure known as, partner investigation, can give associations a focal point through which to focus on the full scope of invested individuals. Partner hypothesis recommends that we should focus on the interests of any gathering or person who is influenced by, or may influence, a choice or arrangement. What's more, Stakeholder administration hypothesis is unmistakable in light of the fact that it tends to ethics and qualities unequivocally as a focal component of overseeing associations. The finishes of agreeable movement and the methods for accomplishing these closures are fundamentally inspected in partner hypothesis in a way that they are not in numerous speculations of key administration, Getz and Timur (2012). In any case, the partner hypothesis isn't without feedback.

#### *5.1.2 Behavioral Finance Theory:*

The speculation communicates that manner toward direct, dynamic principles, and saw social control, together shape a man's lead objectives and practices, Fishbein and Ajzen (1975). As demonstrated by the speculation of thought about action, if people survey the suggested direct as constructive (mindset), and if they think their basic others require them to play out the lead (passionate standard), this results in a higher desire (motivations) and they will presumably do thusly. The resolve and duty of family interest in strong waste administration depends to an expansive degree on the manners by which the County Governments arranges proper proportions of strong waste administration usage and social part of the network. Poor coordination in County Governments and negative social part of network in connection to strong waste administration influences the eagerness of the network to pay for enhanced strong waste administration.

The hypothesis contains six primary components which are Behavioral aim, Subjective standards, Social standards, Perceived power and Perceived conduct control, Fishbein and Ajzen (1975). All things considered speak to a man's genuine power over the conduct on eagerness to pay for enhance strong waste administration. Family unit individuals build up their eagerness to pay conduct decidedly or adversely as indicated by abstract and social standards. On the off chance that they perceive that their huge others and social weight react to such conduct they change their conduct. Jung (2005) declares that social back hypothesis is centered around pertinence to specialist organizations of speculation administration. Specialist organizations gaining from conduct back should figure out how to commit out their very own errors and those of others, understand those missteps, and take relief methodologies where vital and relevant.

***5.1.3 Institutional Theory:***

Open approach is dauntless by government establishments, authorization bodies which give benefits and give arrangement authenticity, Bantel (2001). The arrangement master applies rules to all individuals of society and corners the quality of the applying approach; for example, the assembly, official and legal parts of government are models of establishments that order, revise and uphold strategies both that administer resources and arrangement of administrations. Goodstein and Scot (2002) think about strategy as an institutional yield. Government establishments have for quite some time been an epicenter center around administration arrangement. The creator additionally states that the arrangement is commandingly decided, put into viable utilize and implemented by the overseeing organizations.

Warner and Walker (2010) affirms that the connection among strategies and government organization is closed in light of the fact that an open strategy can't turn into a common approach until the point when it is selected, put into impact and authorized by government establishments. Boyne (2004) attests that open establishments give open approach authenticity, lawful obligation that approves faithfulness of the general population through all-inclusiveness that is just government arrangements broaden to all individuals in the general public and has the real freedom to detain violators of open strategy. The belief system of most extreme social additions infers no approach ought to be grasped if its expenses outperform its recompense and among strategy choices, arrangement producers ought to pick the strategy that yields the best advantages over expenses.

**5.2 Solid Waste Management Industry in Kenya:**

As demonstrated by the National Environment Management Authority, (2015), Kenya has a creating human masses and a development in urbanization. The urban centers have pulled in gigantic masses of easygoing settlements tenants and the cubicle class. This urbanization and extended riches has incited gigantic volume of waste age and unconventionality of the waste streams. This precedent is exacerbated by making industrialization of the Kenyan economy. Despite the proximity of laws and approaches controlling waste, sensitive execution and poor practices have induced towns and urban locales being overpowered by their own waste, along these lines influencing general success and nature. Amid the time waste organization has been the direction of the adjacent specialists. In any case, most neighborhood pros did not sort out the establishment of authentic waste organization systems and therefore allotted little resources for its organization. Further the social affairs required particular and institutional capacities to direct waste. This has incited the present poor state of waste organization which consolidates erratic dumping, uncollected waste and nonappearance of waste confinement the country over.

Most towns and urban networks have inefficient waste gathering and exchange systems. For instance, an examination enhanced the circumstance Nairobi exhibits that around 30 - 40% of the waste delivered isn't assembled and under portion of the people is served. In Nakuru, it's surveyed that 45% of the waste made is accumulated and organized at Giotto Dumpsite, 18% is recovered and the rest total in the normal. Squander transportation is, all things considered, straightforward using open trucks, handcars, ass trucks among others. These poor transportation modes have provoked littering, making waste a flaw, particularly plastics in the earth. Regardless, a couple of locales has gotten legitimate transportation trucks as stipulated by the Waste Management Regulations. What's more County Governments have privatized squander transportation through Private Public Partnership courses of action. Move of waste in the country remains a significant test as a vast segment of the regions require genuine and adequate exchange regions.

**5.3 Challenges Posed by Solid Waste:**

Initially individuals have expected to discover a method for discarding their junk, Bassis (2016). An appropriate trash transfer is vital to guarantee everybody's wellbeing from conceivable wellbeing dangers. The ill-advised waste transfer of refuse is a noteworthy sociological issue today because of its capacity of harming our surrounding and its capability to be deadly to every single living thing. Its effects increase the danger of antagonistic wellbeing impacts in people and creatures; makes harm eco-frameworks and quicken the obliteration of our condition. The more waste we create, the more we need to discard. Mankind keeps on creating and delivers waste that describes contemporary society, dating from the modern upset with the end goal to satisfy its most central needs of life. Be that as it may, the subsequent creation and utilization of assets wind up with conspicuous issues in regard to strong waste age and administration in assorted parts of the world, Ojewale (2014).

Litter is more successfully seen than portrayed. Something can be named squander when it isn't any more obliging to the proprietor or it is utilized and neglects to satisfy its motivation, Gourlay (1992). As exhibited by Miller (1988), waste is any purposeless, appalling or disposed of material that isn't fluid or gas. An extraordinary blend of substances including fine development, dregs, metal, glass, paper and cardboard, materials, putrescible vegetable materials and plastic depict waste, Sengupta and Sengupta (2014). The problem of poor environmental sanitation affects all community members especially children who suffer most in the event of disease outbreak. Children are found playing and defecating onto the rubbish dump bare-footed. This may cause disease infection in the children. For example, the outbreak of cholera in Bauleni claimed the lives of at least three children, in Bauleni Township alone more than 30 cases of Cholera were reported during the 2015-2016 rain seasons, Idlibi (2017). Disease connected with poor sanitation, such as malaria and diarrhea are very common. Waste in Bauleni Township is regularly discarded in open zones, canals, and at the back of or in the middle of structures, most likely because of the deficient waste administration hardware or the long separations to the clean destinations. The specialists particularly advertise sellers additionally leave their losses in heaps for quite a long time before they are at last gathered and taken to clean locales for transfer.

**5.4 Improved Solid Waste Management Determinants:**

***5.4.1 The Extent Recycling Influences Improved Solid Waste Management:***

Reusing spares essentialness, helps keep materials out of landfills and incinerators, and gives unrefined materials to the creation of new things. Right when waste can't be avoided, reusing is the best choice, Zhu et al., (2007). Reusing is more than developing the life of landfills. It is tied in with affecting the best usage of the advantages we to have open and directing those benefits for who and what is to come. It is tied in with directing water, essentialness, land and unrefined materials. Reusing joins dealing with utilized materials into new things to dismiss maltreatment of possibly pleasing materials, lessen the utilization of crisp unpleasant materials, diminish centrality use, decrease air polluting and water contamination by diminishing the need for "conventional" squander trade, and lower ozone depleting substance radiations when wandered. Firms can modify their current practices to decrease the degrees of waste made by changing the structure, make, purchase, or use of materials or things. For example, a connection could encourage operators to simply print what they require and ensure that printer settings are defaulted to print twofold sided to save paper. Reuse of things and packaging draws out the critical closeness of these materials in that limit yielding reusing. Reuse is the fix, reestablishing, washing, or just fundamental recovery of worn or used things, machines and furniture and building materials.

Reusing is a key territory of present-day waster decreasing and is the third piece of Recyclable materials join distinctive sorts of glass, paper, metal, plastic, materials, and equipment. Anyway, proportionate genuinely, the treating the earth or other reuse of biodegradable waste -, for instance, sustenance or garden misuse isn't expectedly seen as reusing. Materials to be reused are either passed on to a get-together concentration or got from the curbside, by then orchestrated, cleaned, and reprocessed into new materials bound for social affair. Reusing Saves money, vitality, trees the planet Earth. When we observe the environment, we determine that almost all kinds of waste can be recycled however the difference then comes in the value that is generated from the recycled material, the value of the materials recycled also majorly vary depending on the demand for such recycled material, materials that have high demand levels often have a higher sale value compared to materials with low resale value. Material recycling mostly depends on the policies that a government has enforced on recycling and also the availability of buyers, Zhu et al., (2007). There are several advantages of recycling. For waste managers, recycling helps in the overall reduction of the waste volume, there is a lot of cost saved from

handling, collecting, transporting such waste and disposal of the waste in general. The economy will also benefit from recycling through reduction of cost of fertilizers since organic waste can easily be transformed into fertilizers, in addition the economy benefits since more people will get employment. The environment is the overall beneficiary of recycling since there will be an overall sustainability of environment and waste going into storage sites will be reduced resulting to a more manageable system, Zhu et al, (2009).

Waste segregation at source is a key step towards effective recycling. Segregating plastics from paper at source can enable companies to find better ways of recycling paper and plastic, Festus & Ogoegbunam (2012). One of the most difficult activities in the recycling process is the mixture of the different types of waste these could be mixture of paper, plastic and even food stuff. It is difficult to effectively recycle waste when is not separated or segregated at source, in addition mixing of different types of wastes leads to poor quality of the products being recycled, Hosoda (2014). Isolation of a wide range of waste at source is the first and most vital advance that will prompt sparing of assets, for example, time and work with regards to waste reusing. In a strict sense, reusing of a material would make a fresh supply of a relative material for example; used office paper would be changed over into new office paper, or used foamed polystyrene into new polystyrene.

***5.4.2 The Extent Government Policies Influences Improved Solid Waste Management:***

One method to ensure effective waste management is having proper waste management systems which are included in the policies and procedures within a company. The foundation of the National Environment Management Authority (NEMA) in Kenya for instance has seen it having greater command in implementing and guaranteeing consistence with more extensive natural laws, Muniafu and Otiato (2010). NEMA holds fast to protect and enhance the nature of condition through coordination, help and authorization while in the meantime it urges people and corporate to progress in the direction of maintainability of the earth. A standout amongst the best methods for limiting or lessening waste is through presentation of a tax policy that will ensure that individuals are taxed based on the amount of waste they produce. In addition, higher taxes can be imposed on raw materials that contribute most to waste to encourage manufacturers to produce goods that generate less waste, Hariz and Bahmed (2013). Reduction of VAT on items with environmentally friendly labels could help in reducing the amount of waste from a production and a consumer perspective. Goals for waste prevention and incorporation of such goals in the waste strategies and policies are vital in promoting sustainability. It may be a tough for to enforce waste prevention measures when dealing with consumption but it is definitely a key measure when it comes to waste legislation and policy making. The major shortcomings in the management of waste is inability to force waste generators reduce the amount of waste being generated, since that is the first step to effective waste management. Instilling waste discipline is another loophole, there is no system in place that would ensure people are responsible for the waste they generate and that they are liable for their actions. Putting up effective systems to ensure individuals are held accountable for the amount of waste generated would be a plus. Environmental assessment audits are also not adequately done both within the companies and outside. These assessments would be important in identifying whether individuals and companies comply and that they adhere to the safety standards, Muniafu and Otiato (2010).

As indicated by Kariuki (2015) adherence to made rules and guidelines by policy makers in developed nations energized handling significant litter organization issues in the urban networks. Kenya has gained ground in approval of city by-laws an incredible arrangement should be done in harmonization and coordination of adjoining government by-laws and waste association laws. Nairobi County by laws Section 8 (9) requires the occupiers of nuclear family and exchange premises to separate abuse which can be reused and put in another compartment given by County or the waste supervisor. This course of action guarantees that each generator of strong waste separates abuses which the ability would then have to be reused and put in discrete holders.

A critical issue and enhancement impediment in creating countries is the nonattendance of as a rule prepares for waste administration at the area and national measurements, Ogawa (2001). Waste administration in developing countries has gotten less thought from methodology designers and scholastics than that paid to other urban natural issues, for instance, air pollution and waste water treatment. Regardless, the improper dealing with and exchange of waste includes a noteworthy issue: it adds to the high horridness and passing rates in various Third World urban zones. Neglecting the manner in which that city professional has held the responsibility of directing waste from their beginning once again three centuries back, the issue only all over got the idea it advocated. Picked administrators and furthermore the metropolitan pros by and large consign the commitment of directing city waste to junior specialists, for example, sterile assessors.

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***5.4.3 Education and Awareness and its influence on Solid Waste Management:***

Successful industrial waste management is often attributed to many reasons arising from policy implementation; however, the main reason why most companies have succeeded in industrial waste management is due to public waste awareness and support. One of the challenges facing proper waste management in Nigeria is lack of proper public waste awareness. This is also observed by the fact the public has a negative attitude towards waste management; hence the government should carry out campaigns to enlighten the public on waste and waste management, Babalola (2010). In addition, involving communities in waste management programs often promotes publicity with tips on waste management hence eventually minimizing waste, Young, Ni and Fan (2010). Similarly, Wilson (2013) indicates that two main underpinning group of drivers of waste management include public awareness and responsibility issues. Waste awareness is critical in ensuring that there is waste management sustainability. Conduct instruments assume a job in waste administration procedures through activities that advise and teach a portion of these activities incorporate waste reviews, school programs, publicizing, preparing, and rivalries. Training has been appeared to be a basic segment in empowering open investment in reusing programs. Waste educational programs would ensure that communities are involved by increasing awareness and commitment towards waste, increasing capability of different staff in identifying opportunities that would lead to waste minimization and avoidance and ensuring that operational staff are adequately trained for foster compliance with relevant waste regulations and be able to report any negative implications or observations, Bolaane (2006).

Bringing issues to light about various waste administration projects can have constructive outcomes, yet there are a few techniques which can be utilized to change conduct to enhance investment or right issues. When new activities are presented, individuals will require time to modify until the point when the new arrangement winds up typical Behavior, yet once this Behavior is built up it is hard to break. Awareness of impacts of waste has not been enforced in most areas, we see many companies and communities littering everywhere, this is evidence of lack of proper awareness in most areas when it comes to waste management. One of the goals of National Waste Management is to create awareness on waste management issues and to add practical waste projects to basic education curricula, Timlett and Williams (2009). Waste awareness and participation can also be enhanced more by creating recognition programs such as the cleanest town competitions, coming up with specific performance evaluation criteria and reward and recognition In addition, producer responsibility must be aligned to the overall waste management plans and consumer awareness programs should also be incorporated in the industry waste management plans. Waste awareness can also be created through door to door awareness and motivation programs which involve establishing contact with participants and providing feedback, it also helps in reducing the time lag that would be created between information communication and when the actual waste collection begins. Importance of door to door awareness campaigns is that communication is effectively passed on to the participant and often reduces any elements of rumor mongering, building confidence of the participants and also assisting in clarifications of any issues of concern. Motivating individuals towards waste intolerance is a plus since; the individuals will exert pressure to the companies and authorities that will ensure proper waste management support and implementation, Muniafu and Otiato (2010).

For the outstanding execution of waste undertaking, there is requirement for gifted work force that can fulfill waste administration service. These assignments generally join organizing the general outline of execution system, setting up and working relentless modernized structure, empowering learning in clever events and supervising correspondence of checking and appraisal revelations. Where the staff capacity to deal with undertaking usage is sketchy, at that point there ought to be space for redistributing quality talented staff to execute similar orders. This implies there is have to get qualified and gifted staff from beginning who presents distinctive aptitudes from measurable, information administrators and undertaking implementers. Public training is one of the basic segments required in a strong waste undertaking usage framework. With regards to extend usage, there are a few terms that are utilized for human preparing, for example, checking and assessment preparing, training and human asset advancement for observing and assessment. In this way, there ought to be clarity on obligations to guarantee professionals set aside to lead and guide the execution of the undertaking is fit for consequently accomplishment of value venture results.

***5.4.4 Participation and its influence on Solid Waste Management:***

Kaloki (2015) revealed that, solid waste management was carried out by cart pushers, resource merchants, private solid waste collectors, public, and neighborhood and estate associations. It was further found out that the County Government collects and then transports waste to a specific dumping site. Potential roles that the public played were waste separation, composting, distribution of solid waste containers and subsequent re-usage of collected and separated wastes. Various

challenges however suffice in attempts to enhance sustainable waste management for instance; inadequate resources, averseness, poor attitudes and solid waste management knowledge gap. In order to ensure homesteads readily participate in waste re-use, quality of environmental education ought to be good, an efficient waste collection regime and attitudes and subsequent enforcement scheme sought to be enhanced. Waste collection regimes therefore need to receive adequate environmental education and attention in order to ensure that the public embrace waste re-use with ease. This will consequently translate to a ready market of re-used products thus ensuring that the demand levels for such related products are sustainable. If the public can be associated and readily involved in waste re-use projects so as to contribute their own efforts, sustainability of waste management programs can be achieved hence yield success. Relevant authorities ought to consider the social and economic status of the community involved in waste management so as to ensure that started waste management projects are successful in the immediate surroundings, Tsai (2007). Various social factors for instance higher income and education levels elicit the public will to readily participate in proper solid waste management programs for instance waste re-use since they know that these efforts are geared to protect the environment. Joardar (2000) argued that waste re-use strategies that are based on door-to-door collection charge regimes can indeed support waste sorting and re-usage. This system can stimulate there-usage of wastes hence significantly reducing on waste generation at source. Further, these charges can be charged to commercial and residential establishments with special considerations to household size.

## 6. CONCEPTUAL FRAMEWORK

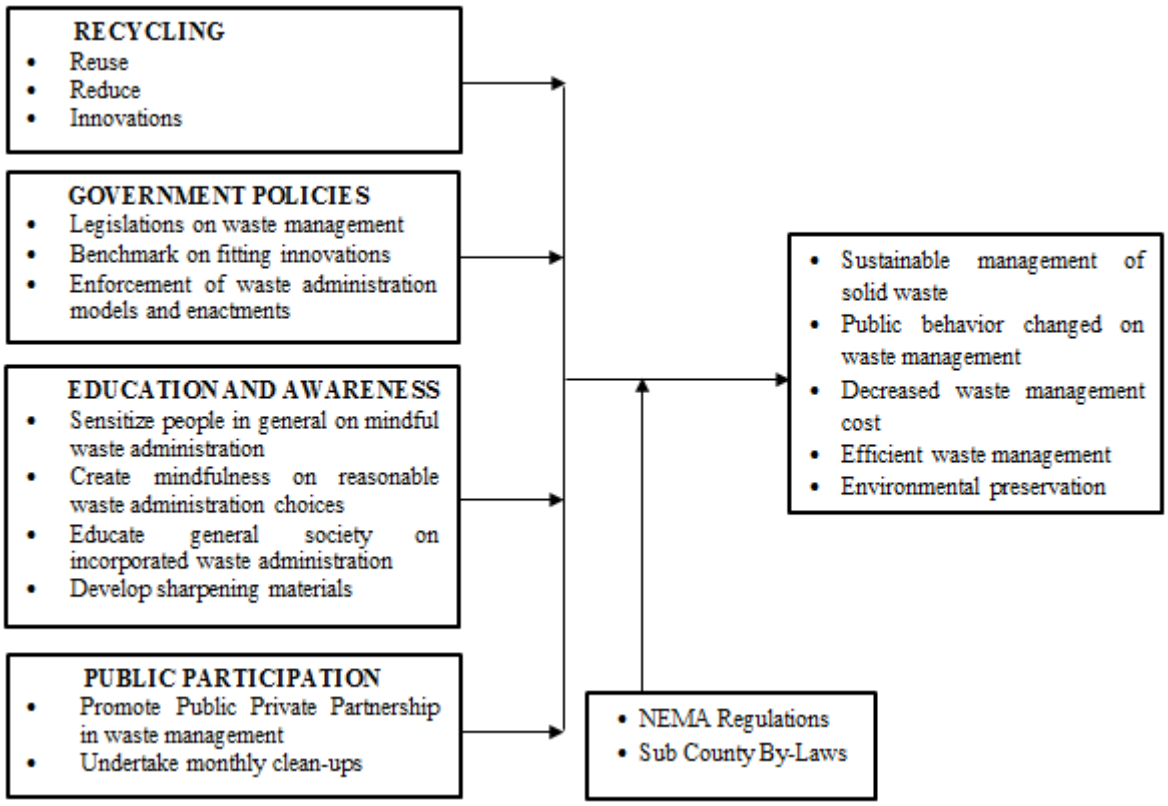


**Figure 1: Conceptual Framework**

## 7. RESEARCH METHODOLOGY

### 7.1 Research Design:

Research design is the precise arrangement to deliberate a logical issue, Silverman (2011). This is the game plan of conditions for information accumulation and resulting investigation in a way that endeavors to join significance to the exploration targets and economy in the lead of research techniques. Research design along these lines reveals insight into the techniques which were utilized by the investigation to accomplish the coveted targets. Moreover, examine

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configuration decreases the odds of illustration off base inductions from information. The examination chose a descriptive survey design study plan. This is utilized when a specialist needs to decide the attributes of a specific component, Hopkins (2008).

**7.2 Target Population:**

Study population entails well defined people, firms, services, group of things, households, elements or events under study, Ngechu (2004). Therefore, a population is the total of individuals, groups or elements that are studied by the researcher. Target population for the study comprised of 450 employees in the department of energy, environment & solid waste management in Mombasa County. (See Appendix I) and summary in table 1:

**Table 1: Target Population**

| S/N | SECTION | TARGET POPULATION |
|---|---|---|
| | Administration | 14 |
| | Environment Pollution | 9 |
| | Environment Parks | 93 |
| | Solid Waste Management | 333 |
| | Trade | 1 |
| | Total | 450 |

**7.3 Sample Size and Sampling Procedure:**

This is connected with the choice of a subset of people from inside a populace to appraise the qualities of entire populace. The two principle points of interest of inspecting are the quicker information gathering and lower cost, Robert (2004). The example populace is an experimentally chosen subset of the objective populace. When the objective populace has been characterized, the example of members inside the objective populace will be chosen.

***7.3.1 Sample Size:***

In this examination a sample size of 240 respondents was the touch base by utilization of Morgan's table for test estimate (see Appendix III). In this exceptional situation, legitimate sample gauge is a basic issue just to ensure that the delegate of the examination and enough cases to run the multivariate examination, for instance, extraordinary direct backslides amid information investigation later of this examination.

**Table 2: Sample Size**

| S/N | SECTION | TARGET POPULATION | SAMPLE SIZE |
|---|---|---|---|
| | Administration | 14 | 7 |
| | Environment Pollution | 9 | 5 |
| | Environment Parks | 93 | 50 |
| | Solid Waste Management | 333 | 178 |
| | Trade | 1 | 1 |
| | TOTAL | 450 | 240 |

**7.4 Data Collection Methods:**

The questionnaire was utilized in this examination with closed ended polls. A survey is an arrangement of inquiries on a subject or gathering of themes intended to be replied by the respondent. Closed ended or structured questionnaire is where the respondent selects one or more options from pre-determined set of responses. The questionnaire consisted of closed ended questions to enable the researcher in testing specific hypothesis as outlined in this study.

**7.5 Data Collection Procedure:**

The questionnaires were individually distributed to respondents in hard copies on a drop and pick later basis mode. The respondents were given a reasonable timeframe required to respond to the questionnaires. The questionnaire had a Likert

scale kind of set questions. This is a requested, one-dimensional scale from which respondents pick one alternative that best lines up with their perception, other than that, it helps to inspect how unequivocally the respondents concur or can't help contradicting the specific proclamations on the scale from 1 to 5.

**7.6 Data Analysis:**

Information handling and measurable investigation are the key undertakings of information examination. The point of information handling (change and standardization) is to enhance ordinariness of informational indexes with the end goal to enhance similarity of metabolite powers. Consequently, factual instruments are utilized to discover noteworthy sub-atomic substances, both for theory testing (Univariate investigation) and bunch examination (multivariate examination which may serve for speculation age), Joyce and Meredith (2006). After respondents have totally returned totally filled polls, information will be rechecked in order to sort those that are accurately filled in order to begin the investigation. Information will be breaking down utilizing mean, frequencies, rates and standard deviation. Relapse investigation will likewise be considered. Everything considered, the data accumulated is then arranged by using the Statistical Package of Social Science (SPSS) programming variant 22. As per Jacob et al, (2003), regression analysis is utilized to decide the base arrangement of the factors which information have been gathered. Gerard, (2008) has characterized that in demonstrate synopsis table where R represents the various relationship coefficients that can decide how firmly the autonomous factors are identified with the reliant variable and $R^2$ is demonstrate the coefficient of the determination. In addition, $R^2$ is to consider the example measure and the quantity of free factors. Balanced $R^2$ are continually being equivalent to or under $R^2$.

The relationship can be an ideal positive connection between two factors spoke to by 1.0, no connection spoke to by 0.00 or an immaculate negative connection spoke to by - 1.0. The accompanying model will be connected in this examination;

$Y = \beta_0 + \beta_1 X_1 + \varepsilon;$

$Y = \beta_0 + \beta_2 X_2 + \varepsilon;$

$Y = \beta_0 + \beta_3 X_3 + \varepsilon;$

$Y = \beta_0 + \beta_4 X_4 + \varepsilon;$

Y was the dependent variable representing improved waste management, $X_1$ to $X_n$ are the independent variables where $X_1$ was recycling, $X_2$ was government policies, $X_3$ was education and awareness while $x_4$ was public participation. $\beta_0$ is a constant showing intercept for regression equation while $\beta_1$ to $\beta_n$ i.e. $\beta_1$, $\beta_2$, $\beta_3$ and $\beta_4$ were the independent variables coefficients while $\varepsilon$ was the random error term, assumed to be normally distributed.

$\beta_1$ – the contribution of recycling variable contributes towards improved solid waste management in Mombasa town

$\beta_2$ - the contribution of government policies variable contributes towards improved solid waste management in Mombasa town

$\beta_3$ - the contribution of education and awareness variable contribute towards improved solid waste management in Mombasa town

$\beta_4$ – the contribution of public participation variable contributes towards improved solid waste management in Mombasa town

## 8. DATA ANALYSIS, PRESENTATION AND INTERPRETATIONS

**8.1 The extent recycling influences improved waste management:**

The respondents were asked for to rate the general degree they think reusing contribute towards improved solid waste organization. In the demand of their mean; reusing saves imperativeness, helps keep materials out of landfills and incinerators, and gives rough materials to the age of new things had a mean score of 1.62 with standard deviation of 0.804; reusing offer immense potential for diminishing ozone hurting substance releases had a mean score of 2.04 with standard deviation of 0.871; reusing screens normal resources including trees, metals and water thusly prompts natural insurance had a mean score of 2.31 with standard deviation of 1.225; various people give things or materials to other

individuals who require and can use the things had a mean score of 2.42 with standard deviation of 1.137; most affiliations ask agents to simply print what they require and ensure that printer settings are defaulted to print twofold sided to save paper had a mean score of 3.00 with standard deviation of 0.894; many purchased things are created utilizing reused materials had a mean score of 3.77 with standard deviation of 1.032 finally most tenants slope toward reuse of things through settling, revamping, washing, or recovery of worn or used things, machines, furniture and building materials had a mean score of 3.81 with standard deviation of 1.415 as showed up in table 3 underneath.

**Table 3: Influence of recycling waste management**

| | Mean | Std. Deviation |
|---|---|---|
| Recycling saves energy, helps keep materials out of landfills & incinerators, and provides raw materials for the production of new products | 1.62 | .804 |
| Recycling offer significant potential for reducing greenhouse gas emissions | 2.04 | .871 |
| Recycling conserves natural resources including trees, metals and water hence leads to environmental preservation | 2.31 | 1.225 |
| Many people donate products or materials to others who need and can use the items | 2.42 | 1.137 |
| Most organizations encourage employees to only print what they need and ensure that printer settings are defaulted to print double sided to save paper | 3.00 | .894 |
| Many purchased products are made from recycled materials | 3.77 | 1.032 |
| Most residents prefer reuse of products through repairing, refurbishing, washing, or recovery of worn or used products, appliances, furniture and building materials | 3.81 | 1.415 |

Table 4 shows relationship examination among reusing and strong waste administration. The centrality esteem at 95% certainty level is 0.00 which is under 0.5 henceforth implies reusing impacts waste administration.

**Table 4: Correlations analysis for recycling and improved waste management**

| | | **Recycling** | **Solid Waste Management** |
|---|---|---|---|
| **Recycling** | Pearson Correlation | 1 | .918** |
| | Sig. (2-tailed) | | .000 |
| | N | 194 | 194 |
| **Solid Waste Management** | Pearson Correlation | .918** | 1 |
| | Sig. (2-tailed) | .000 | |
| | N | 194 | 194 |

****. Correlation is significant at the 0.01 level (2-tailed).**

From the relapse table 5 underneath; $R^2$ was 0.843 which implied that there was 84.3% variety in solid waste administration because of progress in reusing. The connection coefficient (R) demonstrated the quality of connection between the variable. The investigation discovered that the connection coefficient was 0.918 which clarifies in this manner there was certain connection between solid waste administration and reusing.

**Table 5: Regression analysis for recycling and improved waste management**

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate |
|---|---|---|---|---|
| 1 | .918[a] | .843 | .836 | .188 |

a. Predictors: (Constant), Recycling

The accompanying speculation was tried at the 95% dimension of noteworthiness.

$H_a$: There is a significant relationship between recycling and improved solid waste management.

$H_o$: There is no significant relationship between recycling and improved solid waste management.

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The Analysis of Variance table 6 below showed a significant value of 0.00. This indicated a positive significant relationship between recycling and improved solid waste management.

**Table 6: ANOVA analysis for recycling and improved waste management**

| Model | | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| 1 | Regression | 4.564 | 1 | 4.564 | 128.551 | .000[b] |
| | Residual | .852 | 192 | .036 | | |
| | Total | 5.416 | 193 | | | |

**a. Dependent Variable: Solid Waste Management**

**b. Predictors: (Constant), Recycling**

The study found that recycling when held to a constant zero then improved solid waste management would be 1.893. Other than a unit increment in reusing would prompt an expansion in improved solid waste management by a factor of 1.242 as shown in table 7 below.

**Table 7: Coefficients analysis for recycling and improved waste management**

| Model | | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. |
|---|---|---|---|---|---|---|
| | | B | Std. Error | Beta | | |
| 1 | (Constant) | 1.893 | .299 | | 6.331 | .000 |
| | Recycling | 1.242 | .110 | .918 | 11.338 | .000 |

a. Dependent Variable: Solid Waste Management

**8.2 Government and its influence on improved waste management:**

The respondents were requested to rate the general degree they think government arrangements contribute towards enhanced strong waste administration. In the request of their mean; the province government has their working conditions and productivity upgraded through arrangement of modem hardware and defensive apparatus to specialists had a mean score of 1.58 with standard deviation of 0.703; an enactment is put requiring building proprietors to introduce driven lighting frameworks to spare vitality and empower perceivability henceforth keeping away from superfluous waste dumping during the evening had a mean score of 1.73 with standard deviation of 0.724; reduction of tank on things with regular cheerful names could help in lessening the proportion of waste from an age and a client perspective had a mean score of 1.85 with standard deviation of 1.156; the area master assembles and transports resource misuses, sustenance waste and general misuses freely to a specific dumping site had a mean score of 2.00 with standard deviation of 1.131; an institution was passed by the organization that requires retailers pitching devices to recover and reuse these things had a mean score of 3.12 with standard deviation of 0.816 in conclusion natural assessment audits are sufficient done subsequently recognizing whether individuals and associations concur and hold quick to waste organization measures for example having dustbins on save had a mean score of 3.23 with standard deviation of 1.423 as showed up in table 8 underneath.

**Table 8: Government policies contribution to improved waste management**

| | Mean | Std. Deviation |
|---|---|---|
| The county government has their working conditions and efficiency enhanced through provision of modem equipment and protective gear to workers | 1.58 | .703 |
| A legislation is place requiring building owners to install LED lighting systems to save energy and enable visibility hence avoiding unnecessary waste dumping at night | 1.73 | .724 |
| Reduction of VAT on items with environmentally friendly labels could help in reducing the amount of waste from a production and a consumer perspective | 1.85 | 1.156 |

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| | | |
|---|---|---|
| The local authority collects and transports resource wastes, food waste and general wastes separately to a specific dumping site | 2.00 | 1.131 |
| A legislation was passed by the government that requires retailers selling electronics to take back and recycle these products | 3.12 | .816 |
| Environmental assessment audits are adequately done hence identifying whether individuals and companies comply and adhere to waste management standards for example having dustbins on standby | 3.23 | 1.423 |

Table 9: shows relationship examination between government arrangements and enhanced solid waste administration. The centrality esteem at 95% certainty level is 0.00 which is under 0.5 henceforth implies government approaches impacts solid waste administration.

**Table 9: Correlations analysis for government policies and improved waste management**

| | | Government Policies | Solid Waste Management |
|---|---|---|---|
| **Government Policies** | Pearson Correlation | 1 | .935** |
| | Sig. (2-tailed) | | .000 |
| | N | 194 | 194 |
| **Solid Waste Management** | Pearson Correlation | .935** | 1 |
| | Sig. (2-tailed) | .000 | |
| | N | 194 | 1946 |

****. Correlation is significant at the 0.01 level (2-tailed).**

From the backslide table 10 underneath; $R^2$ was 0.875 which inferred that there was 87.5% assortment in improved solid waste organization in light of advancement in government courses of action. The association coefficient (R) showed the nature of association between the variable. The examination found that the association coefficient was 0.935 which elucidates therefore there was certain association between solid waste organization and government methodologies.

**Table 10: Regression analysis for government policies and improved waste management**

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate |
|---|---|---|---|---|
| **1** | .935[a] | .875 | .870 | .168 |

**a. Predictors: (Constant), Government Policies**

The accompanying speculation was tried at the 95% dimension of noteworthiness.

$H_a$: There is a significant relationship between government policies and improved solid waste management.

$H_o$: There is no significant relationship between government policies and improved solid waste management.

The Analysis of Variance table 11 below showed a significant value of 0.00. This indicated a positive significant relationship between government policies and improved solid waste management.

**Table 11: ANOVA analysis for government policies and improved waste management**

| Model | | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| **1** | Regression | 4.738 | 1 | 4.738 | 167.854 | .000[b] |
| | Residual | .677 | 192 | .028 | | |
| | Total | 5.416 | 193 | | | |

**a. Dependent Variable: Solid Waste Management**

**b. Predictors: (Constant), Government Policies**

The study found that government policies when held to a constant zero then improved solid waste management would be 0.176. Other than a unit increment in government strategies would prompt an expansion in enhanced solid waste administration by a factor of 0.576 as appeared in table 12: below

**Table 12: Coefficients analysis for government policies improved waste management**

| Model | | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. |
|---|---|---|---|---|---|---|
| | | B | Std. Error | Beta | | |
| 1 | (Constant) | .176 | .105 | | 1.668 | .108 |
| | Government Policies | .576 | .044 | .935 | 12.956 | .000 |
| a. Dependent Variable: Solid Waste Management | | | | | | |

**8.3 The extent education and awareness influence improved waste management:**

The respondents were requested to rate the general degree they think instruction and mindfulness contribute towards enhanced strong waste administration. In the request of their mean; do you trust individuals should be more taught regarding the matter of reusing and know where things follow they have been reused had a mean score of 1.27 with standard deviation of 0.452; open getting ready is one of the fundamental sections required in a solid waste endeavor execution structure had a mean score of 1.35 with standard deviation of 0.485; guidance has been had all the earmarks of being an essential portion in enabling open help in reusing programs had a mean score of 1.92 with standard deviation of 1.017; introducing waste organization into school programs is also at least a since adolescents are the inevitable destiny of tomorrow had a mean score of 2.08 with standard deviation of 1.093 and waste care through media like TV, radio, magazines and whatnot is fundamental in ensuring that there is waste organization sensibility had a mean score of 2.19 with standard deviation of 1.096 as showed up in table 13 underneath.

**Table 13: Education and awareness influence on improved waste management**

| | Mean | Std. Deviation |
|---|---|---|
| Do you believe people need to be more educated on the subject of recycling and know where items go after they have been recycled | 1.27 | .452 |
| Public training is one of the critical components required in a solid waste project implementation system | 1.35 | .485 |
| Education has been shown to be a critical component in encouraging public participation in recycling programs | 1.92 | 1.017 |
| Embedding waste management into school programs is also a plus since children are the future of tomorrow | 2.08 | 1.093 |
| Waste awareness through media like TV, Radio, magazines and so on is critical in ensuring that there is waste management sustainability | 2.19 | 1.096 |

Table 14 shows connection examination among training and mindfulness and solid waste administration. The importance esteem at 95% certainty level is 0.00 which is under 0.5 thus implies instruction and mindfulness impacts solid waste administration.

**Table 14: Correlations analysis for education and awareness on improved waste management**

| | | **Education and Awareness** | **Solid Waste Management** |
|---|---|---|---|
| **Education and Awareness** | Pearson Correlation | 1 | .877** |
| | Sig. (2-tailed) | | .000 |
| | N | 194 | 194 |
| **Solid Waste Management** | Pearson Correlation | .877** | 1 |
| | Sig. (2-tailed) | .000 | |
| | N | 194 | 194 |

****. Correlation is significant at the 0.01 level (2-tailed).**

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From the backslide table 15: underneath; $R^2$ was 0.769 which inferred that there was 76.9% assortment in solid waste organization in view of advancement in guidance and care. The association coefficient (R) demonstrated the nature of association between the variable. The examination found that the association coefficient was 0.877 which clears up consequently there was certain association between upgraded solid waste organization and guidance and care.

**Table 15: Regression analysis for education and awareness improved waste management**

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate |
|---|---|---|---|---|
| 1 | .877[a] | .769 | .760 | .228 |

**a. Predictors: (Constant), Education and Awareness**

The accompanying speculation was tried at the 95% dimension of noteworthiness.

$H_a$: There is a significant relationship between education and awareness and improved solid waste management.

$H_o$: There is no significant relationship between education and awareness and improved solid waste management.

The Analysis of Variance table 16 below showed a significant value of 0.00. This indicated a positive significant relationship between education and awareness and improved solid waste management.

**Table 16: ANOVA analysis for education and awareness improved waste management**

| Model | | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| 1 | Regression | 4.167 | 1 | 4.167 | 80.047 | .000[b] |
| | Residual | 1.249 | 192 | .052 | | |
| | Total | 5.416 | 193 | | | |

**a. Dependent Variable: Solid Waste Management**

**b. Predictors: (Constant), Education and Awareness**

The study found that education and awareness when held to a constant zero then improved solid waste management would be 0.556. Besides a unit increase in education and awareness would lead to an increase in improved solid waste management by a factor of 0.519 as shown in table 17 below;

**Table 17: Coefficients analysis for education and awareness improved waste management**

| Model | | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. |
|---|---|---|---|---|---|---|
| | | B | Std. Error | Beta | | |
| 1 | (Constant) | .556 | .112 | | 4.982 | .000 |
| | Education and Awareness | .519 | .058 | .877 | 8.947 | .000 |

**a. Dependent Variable: Solid Waste Management**

**8.4 The extent public participation influences improved waste management:**

The respondents were requested to rate the general degree they think open interest contribute towards enhanced strong waste administration. In the request of their mean; strong waste administration is being done via truck pushers, asset shippers, private strong waste authorities, open among others had a mean score of 1.69 with standard deviation of 0.970; nationals are willing paying for gathering of the waste that they create in their home/shop/slow down had a mean score of 1.92 with standard deviation of 0.935; general society takes an interest in the strong waste administration process through individual family unit waste arranging had a mean score of 2.04 with standard deviation of 1.113 lastly network associations have been urged to advance reusing exercises thus enhancing the dimension of open cooperation had a mean score of 2.69 with standard deviation of 1.258 as appeared in table 18 underneath.

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**Table 18: The extent public participation influences improved waste management**

| | Mean | Std. Deviation |
|---|---|---|
| Solid waste management is being carried out by cart pushers, resource merchants, private solid waste collectors, public among others | 1.69 | .970 |
| Citizens are willing paying for collection of the waste that they generate in their home/shop/stall | 1.92 | .935 |
| The public participates in the solid waste management process through individual household waste sorting | 2.04 | 1.113 |
| Community organizations have been encouraged to promote recycling activities hence improving the level of public participation | 2.69 | 1.258 |

Table 19 shows relationship examination between government approaches and solid waste administration. The importance esteem at 95% certainty level is 0.00 which is under 0.5 henceforth implies government approaches impacts enhanced solid waste administration.

**Table 19: Correlations analysis for public participation on improved waste management**

| | | **Public Participation** | **Solid Waste Management** |
|---|---|---|---|
| **Public Participation** | Pearson Correlation | 1 | .854** |
| | Sig. (2-tailed) | | .000 |
| | N | 194 | 194 |
| **Solid Waste Management** | Pearson Correlation | .854** | 1 |
| | Sig. (2-tailed) | .000 | |
| | N | 194 | 194 |
| ****. Correlation is significant at the 0.01 level (2-tailed).** | | | |

From the backslide table 20 underneath; $R^2$ was 0.729 which suggested that there was 72.9% assortment in improved solid waste organization as a result of advancement out in the open help. The association coefficient (R) showed the nature of association between the variable. The examination found that the association coefficient was 0.854 which clears up along these lines there was certain connection between enhanced solid waste administration and open investment.

**Table 20: Regression analysis for public participation improved waste management**

| **Model** | **R** | **R Square** | **Adjusted R Square** | **Std. Error of the Estimate** |
|---|---|---|---|---|
| **1** | .854[a] | .729 | .718 | .247 |
| **a. Predictors: (Constant), Public Participation** | | | | |

The accompanying speculation was tried at the 95% dimension of noteworthiness.

$H_a$: There is a significant relationship between public participation and improved solid waste management.

$H_o$: There is no significant relationship between public participation and improved solid waste management.

The Analysis of Variance table 21 below showed a significant value of 0.00. This indicated a positive significant relationship between public participation and improved solid waste management.

**Table 21: ANOVA analysis for public participation on improved waste management**

| Model | | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| 1 | Regression | 3.949 | 1 | 3.949 | 64.607 | .000[b] |
| | Residual | 1.467 | 192 | .061 | | |
| | Total | 5.416 | 193 | | | |
| a. Dependent Variable: Solid Waste Management | | | | | | |
| b. Predictors: (Constant), Public Participation | | | | | | |

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The study found that public participation when held to a constant zero then improved solid waste management would be 0.667. Besides a unit increase in public participation would lead to an increase in improved solid waste management by a factor of 0.385 as shown in table 22 below.

**Table 22: Coefficients analysis for public participation improved waste management**

| Model | | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. |
|---|---|---|---|---|---|---|
| | | B | Std. Error | Beta | | |
| 1 | (Constant) | .667 | .111 | | 6.007 | .000 |
| | Public Participation | .385 | .048 | .854 | 8.038 | .000 |

**a. Dependent Variable: Improved Solid Waste Management**

### 8.5 Solid Waste Management Determinants:

The respondents were requested to rate the general degree they think the fundamental waste administration rehearses decide enhanced town neatness. In the request of their mean; open interest adds to solid waste administration had a mean score of 1.38 with standard deviation of 0.496;reusing adds to solid waste administration had a mean score of 1.42 with standard deviation of 0.504; training and mindfulness adds to solid waste administration had a mean score of 1.50 with standard deviation of 0.510 lastly government strategies adds to solid waste administration had a mean score of 1.58 with standard deviation of 0.504 as appeared in table 23 beneath.

**Table 23: Solid Waste Management Determinants**

| | Mean | Std. Deviation |
|---|---|---|
| Public participation contributes to solid waste management | 1.38 | .496 |
| Recycling contributes to solid waste management | 1.42 | .504 |
| Education and awareness contribute to solid waste management | 1.50 | .510 |
| Government policies contributes to solid waste management | 1.58 | .504 |

## 9. DISCUSSION OF THE FINDINGS

For the principle focus of the examination which was tied in with rating the general degree they think reusing contribute towards improved solid waste organization. Most respondents agree that reusing saves imperativeness, helps keep materials out of landfills and incinerators, and gives unrefined materials to the age of new things. Respondents in like manner demonstrate that reusing offers a colossal potential for reducing ozone hurting substance releases. Disclosures charged that reusing screens trademark resources including trees, metals and water thus prompts regular protecting. Most respondents exhibit that giving of things or materials to other individuals who require and can use the things can incite diminished waste. By affiliations asking delegates to simply print what they require and ensure that printer settings are defaulted to print twofold sided to save paper is moreover agreed that it can provoke decreased wastage. Waste diminishing can in like manner be drilled by getting things are delivered utilizing reused materials. The examination in like manner underpins reuse of things through settling, reestablishing, washing, or recovery of worn or used things, devices, furniture and building materials. $R^2$ was 0.843 which inferred that there was 84.3% assortment in solid waste organization in view of advancement in reusing. The association coefficient (R) showed the nature of association between the variable. The examination found that the association coefficient was 0.918 which elucidates likewise there was sure association between solid waste organization and reusing. The examination found that reusing when held to an enduring zero by then improved solid waste organization would be 1.893. Other than a unit augment in reusing would incite an extension in enhanced strong waste administration by a factor of 1.242.

The second objective was finding the extent government policies contribute towards improved solid waste management. Ensuring working conditions and efficiency is enhanced through provision of modem equipment and protective gear to workers. Mombasa County has also put a legislation is place requiring building owners to install led lighting systems to save energy and enable visibility hence avoiding unnecessary waste dumping. Nationally the government may reduce VAT on items with environmental friendly labels which could help in reducing the amount of waste from a production and a consumer perspective. The local authority collects and transports resource wastes, food waste and general wastes

separately to a specific dumping site identified in Mwakirunge. Though not passed, respondents indicate that government may do a legislation requiring retailers selling electronics to take back and recycle these products. Environmental assessment audits should be adequately done hence identifying whether individuals and companies comply and adhere to waste management standards for example having dustbins on standby. $R^2$ was 0.875 which implied that there was 87.5% variety in enhanced solid waste administration because of progress in government strategies. The association coefficient (R) demonstrated the nature of association between the variable. The examination found that the association coefficient was 0.935 which illuminates as such there was sure association between solid waste organization and government procedures. The examination found that organization approaches when held to a consistent zero by then improved solid waste organization would be 0.176. Other than a unit increase in government game plans would incite an extension in improved solid waste organization by a factor of 0.576.

The third objective was deciding the degree to which instruction and mindfulness contribute towards enhanced strong waste administration. Open preparing is one of the basic segments required in a strong waste undertaking usage framework. Instruction has been appeared to be a basic segment in empowering open interest in reusing programs. Most respondents concur that implanting waste administration into school programs is additionally or more since kids are the eventual fate of tomorrow. Waste mindfulness through media like TV, radio, magazines et cetera is basic in guaranteeing that there is waste administration manageability. $R^2$ was 0.769 which inferred that there was 76.9% assortment in solid waste organization due to advance in preparing and care. The association coefficient (R) exhibited the nature of association between the variable. The examination found that the association coefficient was 0.877 which elucidates thusly there was sure association between improved solid waste organization and preparing and care. The examination found that preparation and care when held to an unfaltering zero by then improved solid waste organization would be 0.556. Other than a unit increase in preparing and care would provoke a development in improved solid waste organization by a factor of 0.519.

The forward target was to discover the degree to which open investment contribute towards enhanced strong waste administration. Discoveries show that strong waste administration is being completed via truck pushers, asset shippers and private waste authorities open among others. Additionally discoveries show that subjects are eager to paying for gathering of the waste that they produce in their home/shop/slow down. The general population takes an interest in the strong waste administration process through individual family unit waste arranging. $R^2$ was 0.729 which inferred that there was 72.9% assortment in upgraded solid waste organization due to advance out in the open participation. The association coefficient (R) exhibited the nature of association between the variable. The examination found that the association coefficient was 0.854 which illuminates thusly there was certain association between improved solid waste organization and open help. The examination found that open help when held to a steady zero by then upgraded solid waste organization would be 0.667. Other than a unit increase visible to everyone collaboration would incite an extension in upgraded solid waste organization by a factor of 0.385.

## 10. CONCLUSIONS AND RECOMMENDATIONS

### 10.1 Conclusions:

Based on findings, this study concluded as follows;

The nature of residential waste here whereby there is a high component of organic waste means that there are already sustainable management methods present in the society and nature. From composting to livestock feeds, these wastes can be turned into valuable resources if put into the right hands. A greater investment in this area would be wise as this would remove around 80% of waste that would have ended up in the dumpsites.

That the solid waste projects in Mombasa County just like any other in the rest of the world have led to jobs creation in the area and other surrounding environs.

The researcher also concludes that health hazards and issues have been surrounding the implementation of the solid waste projects in the area just like any solid waste projects across the world in countries like China, India, Uganda, and many more.

Finally, the public needs to gain more awareness regarding SWM issues so as to protect their own health as well as the cleanliness of the environment. Public dumping, burning of trash and excessive usage of unrecyclable plastic bags have to be cut down. Nevertheless, it is encouraging to see that many organizations have been involved in achieving these goals.

**10.2 Recommendations:**

***Based on the findings;***

Adequate Resourcing of Waste Management Institutions. The waste management institutions should be adequately resourced by the CCM to ensure efficient and effective waste management in the area. The City Council of Mombasa should liaise with other corporate bodies like the United Nations Development Program (UNDP). With the support, adequate dustbin, and core waste management equipment such as compaction truck. People particularly in the low-class residential areas should be made to pay for disposing their waste. This is because they are the very people who generate the waste. That is the „pay as you throw principle" should be introduced. All these should be done through education by letting residents know the importance of environmental cleanliness and how they can contribute to it. This will go to support the financial base of the waste management institutions.

Putting in place an ideal waste management system that embraces a technical approach including collection and transportation plans, waste reduction, recycling and disposal plans. It should be improved management and regulatory systems that embraces an institutional and financial approach including legal, private sector and public education and awareness plans.

Encourage greater public involvement through intolerance to waste mismanagement. This will exert pressure on the authorities and waste management agencies to better their services to the division.

Proper management of landfill. The landfill site should be properly managed to avoid heaping of waste and burning. Waste dumped in the landfill should be spread, compacted and covered with soil. This will prevent heaping of waste in the landfill. Furthermore, the landfill management should ensure that waste that is carried to the landfill does not contain fire.

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