



East African Journal of Environment and Natural Resources

eajenr.eanso.org

Volume 5, Issue 1, 2022

Print ISSN: 2707-4234 | Online ISSN: 2707-4242

Title DOI: <https://doi.org/10.37284/2707-4242>

ENSO

EAST AFRICAN
NATURE &
SCIENCE
ORGANIZATION

Original Article

Influence of Governance on Sustainable Municipal Solid Waste Management in Ruiru Sub-County, Kiambu County.

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Article DOI: <https://doi.org/10.37284/eajenr.5.1.544>

Date Published: ABSTRACT

09 February 2022

Keywords:
*Governance,
Sustainable Municipal
Solid Waste,
Ruiru,
Kenya.*

Sustainable Municipal Solid Waste management has remained a big challenge in Africa and other resource constrained settings. However, to achieve sustainability, the gaps in governance of waste management need to be addressed speedily as populations are expanding rapidly, far exceeding available infrastructure and resources. Ruiru subcounty has a rapidly expanding population which has not been matched with sustainable waste management in commercial and residential sectors. This study sought to establish the influence of governance on Sustainable Municipal Solid Waste management in Ruiru Sub-County. Mixed methods research approach and descriptive research design were used in both data collection and analysis. This involved administration of Questionnaires, interviews and observation checklist through an online platform Kobo Collect. Results of the study showed that the County Government and subsequent sub-counties are responsible for waste management. Despite this mandate there are heaps of waste remain in commercial and residential areas. This is attributed to various governance challenges such as lack of prioritization of waste management, limited financial and human resources, minimal community participation, disregard of informal players in waste management cycle, weak implementation and enforcement of waste management policies. While it is desirable to attain sustainable solid waste management in Ruiru, and while the national legal frameworks are in place, there are major challenges and gaps in solid waste governance. Therefore, this study concludes enforceability of mechanisms, adequacy of funding, wholistic

involvement of all players remain daunting. Unless these are addressed, sustainable waste management will only remain an unattainable goal.

APA CITATION

Gachoki, W., Karanja, D., & Makworo, M. (2022). Influence of Governance on Sustainable Municipal Solid Waste Management in Ruiru Sub-County, Kiambu County. *East African Journal of Environment and Natural Resources*, 5(1), 13-21. <https://doi.org/10.37284/eajenr.5.1.544>

CHICAGO CITATION

Gachoki, Watetu, Dennis Karanja & Micah Makworo. 2022. "Influence of Governance on Sustainable Municipal Solid Waste Management in Ruiru Sub-County, Kiambu County". *East African Journal of Environment and Natural Resources* 5 (1), 13-21. <https://doi.org/10.37284/eajenr.5.1.544>.

HARVARD CITATION

Gachoki, W. Karanja, D. & Makworo, M. (2022) "Influence of Governance on Sustainable Municipal Solid Waste Management in Ruiru Sub-County, Kiambu County", *East African Journal of Environment and Natural Resources*, 5(1), pp. 13-21. doi: 10.37284/eajenr.5.1.544.

IEEE CITATION

W. Gachoki D. Karanja & M. Makworo, "Influence of Governance on Sustainable Municipal Solid Waste Management in Ruiru Sub-County, Kiambu County", *EAJENR*, vol. 5, no. 1, pp. 13-21, Feb 2022.

MLA CITATION

Gachoki, Watetu, Dennis Karanja & Micah Makworo. "Influence of Governance on Sustainable Municipal Solid Waste Management in Ruiru Sub-County, Kiambu County". *East African Journal of Environment and Natural Resources*, Vol. 5, no. 1, Feb 2022, pp. 13-21, doi:10.37284/eajenr.5.1.544.

INTRODUCTION

To achieve sustainable municipal solid waste management, good governance plays a critical role. Governance is the system of values, policies and institutions by which a society manages its economic, political and social affairs through interactions within and among the state, civil society and private sector (Sudders and Nahem, 2004). It involves the formulation and implementation of policies and decisions. Members of the society are given priority in voicing their views and opinions and participating in decision making and implementation of laws and policies. Good governance characteristics include; participation that is equitable, inclusive and with consensus. It is accountable, transparent, responsive, effective and efficient, and follows the rule of law (Kaufmann and Kraay, 2008; Michalski et al., 2001; Sudders & Nahem, 2004). Good governance also assures that corruption is minimized and eliminated, and that the views of all participants are factored in. It involves responsive approaches to the present and future needs of society.

Proper waste management is critical in achieving sustainable and liveable cities. Municipal Solid Waste Management includes functions of

collection, transfer, resource recovery, recycling, treatment and disposal of waste (Eriksson et al., 2005; Hoornweg & Bhada-Tata, 2012; Modak et al., 2010; Ogawa, 2008). Municipal solid waste is mainly composed of household refuse, solid waste from commercial areas and markets and sometimes construction and demolition debris collected within a given municipality or region (Diaz et al., 2005). The main goals of municipal solid waste management includes: protection of environmental health, promotion of good quality of the urban environment, support for efficiency and productivity of the economy and generation of employment and income (Henry et al., 2006).

The Constitution of Kenya 2010 is the supreme law that gives everyone a right to a clean and healthy environment. Other major legislation and policies providing for environmental management include the Environmental Management and Coordination Act and the National Environment policy, National Environment Management Authority (NEMA), National Solid Waste Management Strategy, Urban areas and Cities Act 2011, Physical and Land Use Planning Act of 2019 and County Government Act No.17 of 2012. It is important to note that Kenya has among the best and sufficient legislations on municipal solid waste but the local governments

lack capacity for proper implementation (Ogawa, 2008; Sarfo-Mensah et al., 2019). Lack of prioritization of municipal solid waste management further weakens the institutional capacity (NEMA, 2015). Although policies and legislations governing waste management in Kenya exist, and are cascaded to the counties, including Kiambu County and its sub-counties, the problem of waste management still persists.

The National Solid Waste Management Strategy guides sustainable solid waste management in Kenya with a view to ensuring a healthy, safe and secure environment for all. Waste management is the responsibility of County governments (NEMA, 2015). County Governments are expected to implement minimum requirements across the waste management cycle including waste collection, waste transportation and waste disposal sites. Despite the existence of laws and policies guiding waste management, lack of prioritization, weak implementation and poor practices have led to towns and cities being overwhelmed by their own waste, consequently affecting public health, safety and compromising the environment (NEMA, 2015).

Therefore, this research sought to establish the role of governance of municipal solid waste management in Ruiru sub-county. It borrowed from the theory of governance that emphasizes on good governance, voluntary participation of all stakeholders and putting up appropriate and suitable policies to achieve sustainable waste management.

METHODOLOGY

The study was conducted in Ruiru Sub- County's two wards namely: Gatongora and Biashara wards. The study applied mixed methods research approach with integration of quantitative and qualitative techniques for data collection and analysis. Descriptive research design was used with a research survey undertaken to find out governance influence on sustainable municipal solid waste in Ruiru sub-county. Questionnaires, observation checklists and interview guides were used for data collection. The questionnaires and interviews were administered through Kobo collect, an online platform. Through purposive sampling Ruiru Sub-County was picked by the researcher since it has tremendous growth potential especially due to establishment of Tatu City and Northlands City.

These developments will attract both people and activities to Ruiru thus increasing waste generation.

Through quota sampling two wards in Ruiru Sub-County were identified; Biashara and Gatongora ward. Further, four thematic groups were used in data collection, that is, low-income residential areas, middle income residential areas, high income residential areas and commercial areas. This research applied theoretical saturation, applying guidelines by Guest et al., (2006) where a minimum of 15 interviewees per thematic group were targeted. Several recent studies reported response proportions of between 56-60%. To achieve a desirable response proportion 5 more respondents to each thematic group adding up to 20 per thematic group. A total of 80 questionnaires were administered and 6 key informants were interviewed. Key Informants are articulate and knowledgeable actors in the community, organisations, or professions and who serve as a source of information about a subject. (Fetterman, 2008). Out of the 80 administered questionnaires 70 were filled which represented 87.5 percent response proportion. However, during data cleaning 5 out of the 70 responses to the questionnaires were blank and were therefore omitted. Only 65 fully completed questionnaires were used for analysis. The study achieved a response proportion of 87.5 per cent which was sufficient and exceeded the recommended 70 per cent (Mugenda & Mugenda 2003).

RESULTS

Waste Collection, Transportation and Disposal

Municipal solid waste is primarily collected by the county government (NEMA, 2015). The County Government has contracted licensed private waste collectors to collect waste within the residential areas. 61 per cent of the respondents reported that solid waste was collected by private waste collectors or the county government while 39 per cent reported that their solid waste was not collected at all. For those whose waste was collected by county government and private collectors, they pay a service charge of between KES 100-250 per month that includes provision of the plastic bags for waste collection.

In Wataalam, a low-income neighborhood and other small pockets, the county government collects waste occasionally but only in public spaces. There are no fees charged to individual households for waste collection, neither are they provided with waste paper bags for waste storage. The youth in Wataalam have an initiative to collect waste around the neighborhood but their efforts are too little as still heaps of garbage in the area remain uncollected. 20 per cent of the respondents burn waste while 10 per cent use pits and the remaining dispose waste by the roadsides and available open spaces.

Municipal solid waste in residential areas is collected once or twice a week. 50 per cent of the respondents' reported that waste is collected once while 25 per cent stated that it is collected twice a week. In the commercial areas within Biashara ward garbage is collected often especially from the Ruiru Market, Ruiru CBD and the bus terminus. Despite garbage been collected frequently in the commercial areas, there are still heaps of waste seen around the CBD. There are a few waste bins provided around the commercial areas, and these are not segregated to waste types, meaning the public end up disposing waste haphazardly by the roadsides, drainage channels and open spaces.

Once collected, waste is transported to Thika Kangoki dumpsite. Privately owned trucks that collect garbage are often old and poorly maintained. The garbage collectors have modified the lorries to provide a space where they separate collected waste into metals, plastic, paper and cartons which latter two categories they deliver to recyclers such as Kamongo Paper Recyclers and Chandaria Paper Mills.

Community Awareness and Participation

The researcher sought to find out whether the respondents were aware of any policies or measures put in place by county government to manage MSW. 87 per cent were not aware of any measures

in place while only four per cent were aware of the measures. The respondents were asked if they knew of any Community Based Organizations (CBO) or partnerships in the neighborhood that managed MSW or provided training on MSW. 69 per cent did not know of any while 23 per cent were aware of such initiatives. Further they were asked to mention some of these informal community initiatives, they included; Ruiru Young Generation Change and Taka Taka Solutions. It is notable that Brookside Dairies located inside Northlands City has a waste management system of their own where reuse and recycling are encouraged. They separate waste and encourage employees to take recyclables from their household to the work place for reuse and recycling.

A big proportion of the residents (86 per cent) reported that they had not been involved in any decision making on municipal solid waste management neither had they received any training on municipal solid waste management. 36 per cent of the residents were aware that there are different forms of waste crimes punishable by law while 56 per cent were not aware. For example, they stated that they knew carrying plastic bags was a crime punishable by law but admitted that slowly the plastic bags are being used especially for packaging by vegetable vendors.

National Waste Management Policy and Provision of Basic Municipal Waste Management Resources

The National Waste Management Policy mandates provision of financial, human and infrastructural resources to aid in management of municipal solid waste. These aspects are highlighted below:

Infrastructure Provision

To find out the infrastructure provided in managing municipal solid waste, the key informant was asked to tick and comment on the basic requirements by law.

Table 1: Infrastructure provision checklist

Requirement	Done	Neutral	Not Done	Comment
Zoning of waste collection areas			✓	These areas have not been zoned.
Timely/Regular waste collections		✓		Where waste is collected by private collectors, timely collections are done and sometimes there is delayed collection in areas where the county government is responsible for collection. In market centers and commercial areas, although the sub-county collects garbage they often do not do it regularly or are not aware when the waste receptacles are full as there is no strict adherence to collection schedules.
Provision of public bins	✓			The county has provided a few skips in various parts of commercial areas although these are still not enough
Emptying of skips, bulk containers & waste cubicles	✓			The sub-county has reliable collection of waste in commercial places and market areas. However, most waste still remain uncollected.
Waste transportation by NEMA licensed vehicles to designated disposal sites	✓			This is done by NEMA where they license all waste transportation vehicles for

The research also sought to find out the conditions of the final disposal point for Municipal Solid Waste collected from Ruiru Subcounty. Kangoki dumpsite is located in Thika where all the county municipal solid waste is disposed. According to NEMA, Kiambu County offices, Kangoki dumpsite is in a really bad state and does not meet any of the environmental requirements for a dumpsite or a landfill. This means none of the requirements as outlined in the National Waste Management Policy are met including fencing, weighing of the incoming waste and good accessibility inside and outside the dumpsite. Although licensed waste transporters are charged fees by the county to access the dumpsite, all the key informants agreed that the fee was too low to even support provision of basic requirements for municipal solid waste management.

Human and Financial resources

The key informants agreed that there are minimal finances allocated by the County government to manage municipal solid waste in Ruiru Subcounty. The Environmental Division always shares its budget allocation among the three Departments of Natural resources, Environment and Water. For year ending June 2021, the department was allocated a budget of less than KES One million which the key informants considered inadequate to manage their tasks. The environment department is in charge of both solid and liquid waste management. Key informants reported that with the financial constraints, they are able to hold trainings and build capacity of their employees to manage municipal solid waste management.

DISCUSSION

Waste Collection, Transportation and Disposal

Municipal solid waste management is a function of the municipalities or relevant local authorities. In Kenya County governments are mandated with the responsibility for municipal solid waste (NEMA, 2015). The National Solid Waste Management Strategy outlines minimum requirements to be implemented by county governments. They include waste collection and transportation, designation of waste disposal sites and maintenance and licensing of waste transport vehicles. This research established that NEMA-Kiambu licenses the waste transportation vehicles. The waste transportation vehicles are privately owned individuals and private companies that offer waste collection services in residential estates. These individuals and companies are responsible for the maintenance of waste transportation vehicles. Notably however, most of these vehicles lack modern technology to aid in waste collection and are poorly maintained. For example, the collectors have to manually lift the waste container which is tiresome, time consuming and often they spill waste in the process. These vehicles lack waste separation compartments; therefore, the waste collectors improvise nets where they separate waste into paper, plastic, metals and so on as they transport it. These plastics and containers are delivered to the plastic and paper recyclers.

Waste collection in residential areas is done weekly with exceptions of some areas where it is collected twice weekly by private garbage collectors while in commercial areas the collection is done by the Ruiru Sub-County environmental department. Although, the County waste department reported that they collect waste on a daily basis a lot of it still remains uncollected and openly disposed in open spaces, drainages, and along the roads.

The county has designated waste dumping site in Kangoki, Thika. However, this site does not meet the standards set out by National waste management policy. The dumping site is poorly maintained and has become hazardous to the neighbouring communities. Banda et al., (2021) have pointed out that it is important to have in place and be able to control mechanisms of waste management, and also

have enforcement mechanisms in place. While theoretically this subsisted in Ruiru, there was no enforcement to meet the requirements by either the county government or the National Environment management Authority.

Provision of Infrastructure, Financial and Human Resources

In terms of support infrastructure for MSW, Ruiru Sub- County has 2 garbage trucks, 5 garbage skips and 1 skip loader all under the custody of the Directorate of Environment. The Department of Environment Ruiru collects municipal waste in public areas such as markets, streets, main bus stage and the main commercial nodes. The research established some skips were placed at the main Ruiru market where garbage is stored awaiting collection. It was noted that the skips were overflowing and created an unpleasant scene posing a health and environmental hazards.

The National Solid Waste Strategy (NEMA, 2015), states that most local authorities do not prioritize the establishment of proper waste management systems and hence allocate minimal resources towards the management. The findings of this research confirmed this, as the key informants argued that lack of prioritization of waste management issues has led to the County Government allocating minimal finances to the Department of Environment. The County charges fees to waste transportation vehicles at the Kangoki dumpsite. However, the department is not able to meet daily demands for waste management such as provision of waste support infrastructure, training and capacity building of personnel, community engagements and outreaches. These challenges are not unique to Kenya. For example, Massoud et al, (2019) in their study in Lebanon, have highlighted the importance of fashioning waste management systems that conform to national constraints. In the Ruiru context this would mean involving informal waste management practitioners and the private sector to fill the gap that financial and human resources available cannot fill.

Community Awareness and Participation

Waste management with voluntary community awareness and participation is the social capital that

drives the success of the waste management process (Brotosusilo & Nabila, 2020; Dururu et al., 2015; Marsden, 2008). However, the findings in this study suggest that public awareness and participation are very low. Indeed, 87 per cent of the respondents were not aware of any waste management policies in place. Neither had the respondents been involved in any decision making nor training on municipal solid waste management. Informal players in municipal waste management play a critical role in sustainable solid waste management in Ruiru. However, formal management practices do not recognise or facilitate them. Banda et al., (2021) have pointed out that the informal sector plays a major role in either reducing or exacerbating municipal waste and it is therefore critical to involve the informal sector to achieve sustainable solid waste management.

Governance Strategies and Recommendations

Good governance not only involves policy regulations and laws but also aspects of enforceability and inclusivity. Across Africa, the institutional or administration framework for the environmentally sound management of waste is either lacking or inadequate (United Nations Economic and Social Council, 2009). Involvement and participation of all stakeholders will help lessen the current governance problems. When all stakeholders; waste generators, handlers, formal and informal agencies are involved in the making of waste policies and regulations and implementation of the same, it creates a sense of ownership and belonging among them. This translates to each stakeholder being responsible for each and every action they make regarding waste management thus creating harmony in behavior and environmental protection.

Financing of Municipal solid waste management is an integral part to achieving sustainability. In many low-income and middle income countries 20% of the local budget is allocated for solid waste management (Kaza et al., 2018). This budget allocation is too low to cover all the operation costs. Thus, Ruiru sub-county and Kiambu County should come up with ways to raise funds such as grants, public-private partnerships, private sector involvement. At the moment the private sector involvement is limited to private contractors

engaged or licensed by the county who collect and transport waste. The county should consider reviewing the charges paid by the community for provision of waste collection services. Adequacy of finances will help the County invest in proper infrastructure and technologies for MSWM, training both personnel and the community in ways of sustainable management of municipal solid waste.

Bolaane and Isaac (2015), have suggested that formal privatization of functions of municipal solid waste management has proved a suitable intervention for challenges of solid waste management faced in developing countries. These includes functions of collection, transportation, management of dumpsites, recycling and reuse. The private sector will inject more financial, human and technological resources into MSWM thus improving the services. The findings of this research showed that the County government is unable to prioritize matters of solid waste management. Thus, privatization of the waste management sector will enhance prioritization of solid waste management matters in the County and subsequent Sub-counties.

CONCLUSION

To achieve good governance in Sustainable Municipal Solid Waste, there are various actors to be involved; the government itself, the waste generators and the private sector. The government should seek to achieve equity and inclusiveness in management of MSW. By formulation, and implementation of clear laws and regulations pertaining MSWM. There should be proper financial planning through public-private partnerships, privatization and creating sources of revenue from the MSW system such as collection and disposal fees and MSW tax. This will enable achieve adequate financing for Integrated Sustainable Municipal Solid Waste Management. Lastly, raising awareness and empowering the community in proper management of Municipal Solid Waste will create a sense of ownership and responsibility towards achieving the common goal of sustainability, environmental protection and conservation.

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