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The Peril that is Mwakirunge Dumpsite: A Social Impact Assessment Report

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Abstract

Mwakirunge dump site is the main solid waste holding and handling facility for Mombasa city, a town with a total population of 1.5 million residents. Initially, the main solid waste dumping ground was at Kibarani, a beach site on the main entry to Mombasa city from the Nairobi highway. In 2002, the 'Kibarani' dump site was literally moved to Marimani which is barely 500 meters away from its current location in Mwakirunge. It is estimated that the dumpsite moved from Marimani to Mwakirunge in 2008. It is therefore safer to say the dumpsite has been in its current location for over 10 years. Ideally, the more improved version of dump sites - the landfills, have a lifespan of 5 years with some possibility for extension. Dumpsites should therefore have even much less a period.

The study determined that 54% of the current residents, both within the dumpsite itself and the vicinity, were born and raised there. The remaining 46% either moved into the area due to its expansive farm lands and also in an attempt to escape the ever burgeoning city life that is Mombasa town or migrated alongside the shifting locations of the dumpsite - from Kibarani to Marimani and finally to Mwakirunge. The interesting thing is that while 73% of the total residents say they have no role and are not directly linked to the dumpsite and only 23% are gainfully linked to the dumpsite, a whooping majority of up to 79% cite its negative effect on their daily lives. In other words, they gain nothing from it but lose everything by it. The bitterness increases with those who were born and raised there especially the generation that lived before the dumpsite was relocated to its current site in 2008. Equally, it is important to appreciate that about 27% of the residents including the dump site families have a direct social and economic link with the dumpsite.

The study noted a raft of socio-economic impacts and mostly the negative ones with a few exemptions. Many businesses of up-to 70% experienced negative outcomes from the dumpsite. This was largely in form of contraband goods finding their way into the villages and shops. There were however a few exceptions like the health facilities that were making good business out of treating or dispensing of drugs to a heavily infected population. Major effects were mostly born out of the toxic smoke, smell and flies, mosquitoes (must be understood that this kind of open dumping in a humid tropical climate is a conducive to such disease vectors like flies and mosquitoes). Other debilitating effects noted were; blocked roads which become very slippery during the rains - actually the main road artery connecting the Mombasa city to the villages of Colorado, Ngungombe, Mwakirunge and others pass through the dump site and are unprotected from its ever-increasing solid waste. Still this chain of demoralizing effects continued in the form of water sources contamination, particularly ground water and the main source of household water within the coastal belt of Kenya. The most confounding aspect of this is that once contaminated, it is exceedingly difficult to treat or rehabilitate ground water sources unlike with the surface waters. The study

also noted the sad scenario of contraband goods particularly food items scooped from the dump site finding its way to the shop shelves or family tables - with the consequences of diseases and deaths - a case of five young children who ate biscuits from the dumpsite and became seriously ill is documented in this study. Other social issues included; increased child delinquency due to the negative influence from the dump site, the rampant littering of the entire sub-location occasioned by wastes being blown all over by wind, the increased insecurity, the soaring number of scavenger birds and animals complete with their scary and spread of contaminants were all apparent and well covered within this report.

Further, the study documented a myriad other challenges especially with health, including both the physical, mental and psychological effects. Quite a number of infections were rampant in the area. In fact over a 4 year period, using the data gathered from the public health department from 4 health facilities (dispensaries) spread in the area (Marimani, Mbirikani, Mwakirunge and Maunguja), a total of 37 infections were ever recurring within this area (table 6) each after year. The most common of all diseases were, 1) respiratory tract infections 2) diarrhoea and skin diseases. So widespread was respiratory diseases that they virtually dwarfed other illnesses all the years. This is clearly attributed to the poisonous gases spreading over the area all-day-long throughout the year. Cases of diarrhoea were also high and this is attributed to the open nature of the dump site. It is not just a breeding site of vectors like flies but it also gives rise to outflows being carried by both surface and ground water to adjacent areas. Truth be said, these vectors have a potential to spread and cause havoc in the whole of Mombasa city if no proper action is taken in the near future. Moreover, the diverse natural pathways are enough to spread these toxins to as wide an area beyond the imagined scope of the dump site. Other infections that were gleaned from the healthcare data were; pneumonia, asthma, tonsillitis, Malaria, ear infections, chicken pox, bilharzia, eye infections, animal (dog) bites among several others as shown in table 6.

In regard to mental health, the study unearthed quite a number of issues and infections, namely; sleeping sicknesses, increased stress levels, sadness, anger and even shame. A woman told of psychiatric reaction every morning she wakes up and gets a taste of the smoke. Since, these people have no where to go and are forced into these conditions, the results are such issues like the ones already listed

Background

Mwakirunge dumpsite is the main waste garbage dump for Mombasa County. It is found along the geographical coordinates of 3° 57' 0" South, 39° 40' 0" East. It is within the Kisauni constituency, about 12 Km North of Mombasa Central Business District and about 700 meters South-east of Colorado Shopping Centre in the coastal region of Kenya. Currently, it is the main city's dump site particularly after the closure of Kibarani dumpsite, which has since been transformed into a recreational park. The area generally has a topography of a rugged landscape characterized by valleys and hills. Settlements are clustered and littered over the landscape with some commercial set ups several found meters away. It is located within the coastal strip which generally experiences more than 6 hours of sunshine daily exceeding 8 hours between October and March. The rainfall pattern is bimodal with rainfall averaging between 900-1300mm annually. The long rains come between April and July while the short rains are experienced between November and December. In terms of inhabitants - there are around 500 people living within the site, majority of whom are women and children. The livelihoods are quite diverse with the within and close to the dump site people scavenging through the garbage to find items of sale such as plastics, bottles, pieces of metal, clothes, utensils, paraphernalia, furniture etc. Equally, they also scavenge for food – mostly in the initial stages of spoilage and laced with molds or beginning to rot. There are also some

temporary structures to act as houses against the scorching sun as well as the rains. Most of those houses are not waterproof and not strongly anchored on the ground. During rainy seasons they fall and further expose them to the vagaries of weather. The road network within the dumpsite is rather haphazard and becomes extremely slippery and muddy during rainy seasons. The use of drugs especially bangi is rather common coupled with heavy drinking of the alcoholic drink 'Mnazi' – a local brew made from the coconut plums. It is perhaps reasonable to estimate that a good chunk of their income is spent on these two main items – mnazi and drugs. The place is littered with broken pieces of glass, myriad kind of chemicals and different kind of industrial waste of varied toxicity levels. When these enemies of nature are added to the suffocating fumes of poisonous gases and irritating soils, it qualifies as a true definition of hell, just here under our nose in Mombasa County. Other than the life within the dumpsite, the neighborhood is a burst of life. In the Northern side lies the sprawling estate of Kiembeni – a town growing by leaps and bounds and moving fast towards the fringes of the dump site. On the Western side is the town of Colarado – beaming with new up-coming commercial cum residential houses – unfortunately covered by the irritating smoke coming from the dumpsite most of the times – due to the frequent flow of the wind from the North to the South. On the Western side, lies the farming villages like Mwakirunge and Marimani dotted with several schools and churches, typical Giriama villages of the coast. These areas (lying to the West) are equally affected by the effluents emanating from the dumpsite not to mention the spike in unexplained death rates (personal communication and certified by death records from local hospitals as well as death certificates attached) ostensibly arising from the pollution impacts of the dumpsite. On the Eastern side is the Indian Ocean – receiving the effluent flow.

Scope of the Assignment

During the presentation of Environmental Impact Assessment report for Mwakivunge dumpsite, the Environment and Lands Court sitting in Mombasa directed that a Social Impact Assessment be carried out at the dumpsite to ascertain the extent of its social, economic and health implications to the neighbouring communities. The EIA report had laid bear the air quality parameters, particulate matter and leachates. Consequently, this report is a culmination of an SIA study carried out at the dumpsite in May and June 2024. The area covered the entire Mwakirunge Sub-Location and running through the villages of Mwakirunge, Marimani, Colorado, Mwambani, Gungombe and Mkomani including the entire area actively under the dump site.

Administrative Framework

In theory, County governments are responsible for solid waste collection and disposal in Kenya. The Mwakivunge dumpsite is under the County government of Mombasa which has been slow to obey the law, perhaps due to lack of capacity and conflicting priorities. Obviously, there is need for enforcement of environmental regulations concerning such facilities.

Description of an ideal dump site and the activities

An ideal dumpsite must fulfil efficient and sustainable waste management goals with an optimum balance between costs and residual environmental and social impacts. Five principal ways in which this can be achieved include but not limited to:

1. the *'zero'* option - continuation of existing collection and disposal practices;
2. alternative waste collection and transfer systems;

3. alternative waste disposal systems;
4. alternative sites and accesses for the dumpsite and associated infrastructure; and/or
5. alternative engineering measures and operational practices.

The key features of the design of a county landfill like Mwakivunge should be as follows.

Dump site dimensions

The size of any given dumpsite is determined by various factors, namely; cost land, cost of construction, the population size, type and quantity of wastes, available technology (e.g current technologies have shifted from the dry solid waste handling to bio-reactor systems. Here, in the bioreactor approach, the moisture content of the municipal solid waste (MSW) is increased by recirculating leach-ate to enhance biodegradation). Other factors are; political persuasions, social considerations of a people and the environmental regulations in place.

Ideally, Mombasa county with a population of 1.5 million is mature for the construction of a landfill as opposed to the current dump site. It is high time that the county government of Mombasa invested in a proper and environmentally acceptable landfill especially due to the huge amount of solid wastes emanating from the city and its environs. Only a properly functioning landfill can ensure the following:

Proper leachate handling

Leachates generation is a common phenomenon in any dump site especially if it has existed in the same location for more than one year. Leachates are toxic and need be restricted within the same facility and safely collected for disposal. Leachate is generated due to chemical processes in the dump site, the water content of the waste deposited at the site and the inevitable infiltration of rainwater during operation of the site. It contains several organic and inorganic pollutants and need to be collected and treated. This is not the case for Mwakirunge, where leachates find their way into the adjacent lands and even contaminating the adjacent water flows. So dangerous is this phenomenon especially if left unchecked - for the chemicals in the leachates could stay longer in the media exposed to them.

Gas emission and lack of both collection and treatment

The anaerobic decomposition of organic substances inside a dump site causes emission of a gas. The gas can, in some circumstance, migrate away from the site and cause explosions. These explosions can also be in small scale and stories were told of several burns within the dump site. Best practice is to collect the gas and burn it, with energy recovery (e.g. a small power plant for energy or heat production) if feasible from the economical point of view. With a good de-gasifying system, it will be possible to collect at least 50 % of the produced gas. This is one source of motivation to improve of the dump site and possibly upgrade it into a landfill with a potential to collect and even transmit the gas produced.

Surface Water Collection

The volume of rainwater or surface run-off that comes into contact with the waste in the dump site, or the leachate, should be minimized to reduce the potential for contamination. The rainwater that flows from the surrounding areas and (after filling) from the surface seal of the dumpsite should be captured by a ditch or ditches within the dumpsite and directed to the lowest point. From this low point, the run-off water should be led by gravity to some hollow that drains away into a rainwater retention pond.

Waste filling

The vehicles delivering waste have to unload the waste at a distance of about 10m from the actual waste filling area. The waste should be transported to the filling area using a compactor. The waste filling area should be dimensioned in such a way that after approximately 3 days the next waste layer can be started. In this way odour is minimized and waste incorporation by the compactor prevents the production of wind-blown debris. Immediately after waste filling, the active disposal area should be covered with a soil layer of about 20 cm in thickness.

Dump site Infrastructure and Access Roads

Ideally, the roads leading to and inside the dump site area (from the last village to the site area) should be constructed in such a way that they can be used for duplex traffic by trucks. This means that the width of roads must be at least 6.5 m with drivable shoulders of about 1m. In Mwakirunge Dump site even the main road running besides it to Colorado and leading to Kaloleni is all covered by solid waste. The situation is made worse during rainy seasons when the road surface becomes covered. Locals talk of impassable roads complete with slipperiness and smell. A quick look at Mwakirunge Dump site revealed an attempt by the county government of Mombasa to put up an earthen wall also as a way of the protecting the road adjacent to the dump site. There is also a building with toilets to assist persons engaged within the dump site. This is yet to be completed and run around the entire facility. It will help if the following additional infrastructure is added:

The infrastructure includes:

- a control building - also to handle records related to the waste being dumped
- a weighing bridge - it is important to keep track of total amount of waste deposited
- a wheel cleaning unit for trucks that will leave the dumpsite area - this is really important to avoid spread of pollutants to the adjacent areas
- a container area (concrete-paved area) for recycling for safe-guarding undefined waste - this is a big issue in Mwakirunge. Contraband goods, many times buried within the facility were scooped out and found its way into the local market. We show later a case of biscuits scooped from the facility after burial that found its way to the local market. Children who later fed on them were admitted to health facilities with various illnesses.
- a septic tank for sewage - especially for the toilets
- a basic weather station for recording wind speed and direction, humidity and rainfall
- a basic laboratory for analysing samples of waste, groundwater and leach-ates.

The total landfill area should be surrounded by a fence. The access to the site can be closed by a gate.

Identification of Key Issues (Scoping)

This study was focused on the social impact assessment on the particular environmental and social issues which were most likely to give rise to the most significant impacts or are of great concern to the decision makers and stakeholders. This allows the report to focus on issues relevant to decision making.

The identification of the key issues at the Mwakivunge dumpsite are further contained in a court order issued by the Environment and Land Court (ELRC) Mombasa ((ELCPET E017 of 2022) in a case filed by Ainea Ragen acting both for the Mwakirunge Community residents and suing in the public interest and on his own capacity. Indeed, the very court in an order issued on 23rd April 2024 requested for the social, economic and health ramifications of the Mwakivunge dumpsite on the neighbouring communities. In the

very raft of orders, the court in its wisdom granted the petitioner 21 more days leave to file and serve a report on the social, medical and economic dimension of the environmental impact from the dump site. In the earlier submissions, it is clear that petitioner had carried out a great deal of consultation with the residents on the dangers accruing from the dump site and possible amelioration of the same. Moreover, the context of dump site is one in which the unprotected dumping is scattered over a wider area giving rise to severe environmental, health, economic and social concerns. These have included smog and smoke, surface and groundwater contamination, flies and vectors of various diseases plus the social and health problems associated with unregulated waste picking, which affects the poorest people in the neighbourhood. The need to address these issues played a huge influence in the social impact assessment. Some of the key social, economic and health issues of concern were:

Land use: the effects of the project on land uses and values to ensure that the choice for the site had been undertaken sensitively and pragmatically to protect land owners, land users and residents including elements of natural or cultural value.

Impacts related to potential ground and surface water contamination: The project is within a residential area with limited surface and groundwater resources. This study payed a great deal of attention to the movement of water above and below the surface and how the design of the dumpsite addresses these. Attention has also been given to the predicted quantities of waste water, the protection of water resources, surface drainage and the ultimate fate of water passing into the ocean at the creek.

Socio-economic and cultural impacts: a large number of individuals entering the dumpsite freely, collecting valuable wastes for resale, the surrounding retail traders and business communities including the various forms of livelihoods and how these have been affected by the situation of the dump site. The study has therefore investigated the social issues surrounding livelihoods, compensation and resettlement of the affected people as one of the key issues. In addition, the dumpsite has over extended beyond its designated points to private lands covering people's graves which is henceforth an outward infringement on people's cultures and respect for the dead.

Traffic Impacts: The dumpsite attracts many movements of large vehicles, sometimes on small roads. During the rainy season the trunks get stuck and are unable to access the dumpsite thus dumping the waste far away from the dumpsite, this not only makes the roads impassable for business people and school going children but also poses health risks. The routes available to the waste transfer vehicles are thoroughly investigated in the study to ensure that the chosen routes and the design of the landfill and transfer station accesses are reported to minimize adverse effects.

General Environmental/health impacts: the effects in terms of odour and air quality impacts (associated with waste decomposition and waste burning as well as dust from vehicle movements), noise (traffic and site operations), visual and landscape impacts (the visual impression created during operations, the appearance after closure, and the potential presence of windblown detritus/litter) have all been taken into account. There is also a potential impact from vermin such as flying insects, scavenging birds, rats e.t.c. if the facilities are not operated in accordance with good practice.

Potential impact of gas emanating from the dump site: gas is a product of the degradation of waste materials under anaerobic conditions *(i. e.* in the absence of oxygen). With its high content of methane and toxic and inflammable gases, the generation of landfill gas poses significant risks to human, animal and plant health and life. The risk is greatest where gas is allowed to build-up in confined spaces, such as within buildings or in collapsed void spaces within the deposited waste. Accordingly, the study has investigated, and assessed the residual impact.

Public Consultation

Stakeholder Consultation Plan

The Stakeholder Consultation Plan in this study made a division between three phases: scoping, stakeholder consultation and public hearings. During the scoping phase the issues and concerns of stakeholders were explored adequately. During the stakeholder consultation phase stakeholders that have been affected by the dump site were visited and their concerns and conditions explored.

Fig. 1a: Public consultations at Mwakirunge

During the public hearings the interested parties in solid waste management were informed about the study through the court order. Local administration involving the Mwakirunge chief and sub-chief were consulted as well as the member of county assembly and given the opportunity to explain their concerns about the dumpsite.

Outcome of Stakeholder Consultations

- Compensation for affected persons especially those whose graves have been buried by waste and burnt, those who have suffered afflictions (injury, sicknesses or even fatalities) arising from the dangers imposed by the dump site.`
- Protection of school children by fencing off the dumpsite and not building dykes
- Relocation of the dumpsite or enhanced waste management
- concerns about the protection of the ground water resources and aquatic life towards the ocean creek
- requirement for an assessment of transport intensification on routes to and from sites.

- mitigation measures for communities living along transportation routes especially during rainy season when trucks dump waste far from the landfill
- hazardous waste such as medical waste should not be disposed at the dumpsite
- need for public awareness raising
- communities to benefit from improved infrastructure and employment opportunities
- management plans that meet international standards and transparent and fair complaint management procedures
- refuse workers be better protected from accidents and health risks
- waste picker sources of income at risk; employment possibilities in waste separation
- independent NGO involved in the monitoring of land and water resources

Relevant Policy Legislative And Regulatory Framework

There are approximately 77 statutes that guides environmental management and conservation. Most of these statutes are sector specific, covering issues such as public health, soil conservation, protected areas conservation and management, endangered species, public participation, water rights, water quality, air quality, excessive noise control, vibration control, land use among other issues (Kerarapon and Ngong,2018).

According to the National Environment Management Authority (NEMA) guidelines, it is mandatory that projects adhere to all Institutional Framework requirements. The various institutional frameworks directly governing dumpsites projects are: Environmental Management and coordination Act (EMCA) of 1999 and its subsequent supplements the Environmental (Impact Assessment and Audit) Regulation, 2003; EMCA (Waste Management) Regulations, 2006 and EMCA (Water Quality) Regulations, 2006; EMCA (Controlled Substance) Regulations, 2007; EMCA (Noise and Vibration Control) Regulations, 2009; EMCA (Emissions Control) Regulations, 2006; EMCA (Wetlands, River Banks, Lake Shores and Sea Shore Management) Regulations, 2009 and EMCA (Conservation of Biological Diversity and Resources, Access To Genetic Resources and Benefit Sharing) Regulations, 2006. Others are the; Land Acquisition Act (Cap. 295), Land Act Way Leaves Act (Cap. 292), Public Roads and Roads Access Act (Cap. 399), Forest Act, Physical and Land-use Planning Act (CAP 286), Local Government Act (CAP 265), Traffic Act Chapter 295, Public Health Act (Cap. 242), Lakes and River Act Chapter 409, and the Penal Code (CAP 63) 514. The Mwakivunge dumpsite needed to adhere to all of the above listed frameworks and legislations.

More precisely the Mwakivunge dumpsite should have conformed to Environmental Management and Coordination Act of 2015. Specifically abiding with the Environment (Impact Assessment and Audit) regulation 2003, which operationalize the environment management and coordination act 1999. Part II of the said act states that every person is entitled to a clean and healthy environment and has the duty to safeguard the same. In order to achieve the goal of a clean environment for all, all projects under the second schedule of Section 58 of EMCA No 8 0f 1999 must undergo an Environmental Impact Assessment (Kerarapon and Ngong, 2018).

In addition to the legal compliance above, the following legal aspects needed to be taken into consideration: Occupational Health and Safety, 2007 which requires that before any premises are occupied or used a certificate of registration should be obtained from the chief inspector. The occupier must keep a general register with provision for health, safety and welfare of workers on site: Public Health Act Cap 242 Part IX section 115 of the Act which states that no person or institution shall cause nuisance or

condition liable to be injurious or dangerous to human health: Section 116 requires that local authorities take all lawful necessary and reasonable practicable measures to maintain their jurisdiction clean and sanitary to prevent occurrence of nuisance or condition liable to injuries or dangerous to human health.
The Physical Planning Act, 1999 in section 29 empowers the local authorities to reserve and maintain all land planned for open spaces, parks, urban forests and green belts. The same section allows for prohibition or control of the use and development of an area.
The Land Planning Act Cap 303 Section 9 (the development and use of land Regulations 1961) requires that before the local authority submits any plans to the minister for approval, steps should be taken as may be necessary to acquire the owners of any land affected by such plans. Particulars of comments and objections made by the landowners should be submitted, which intends to reduce conflict of interest with other socio-economic activities.
Other Relevant Laws including EMCA (Waste Management) Regulations, 2006. These Regulations guides on the appropriate waste handling procedures and practices. Mwakivunge dumpsite handles large quantity of solid waste dumped over the years since its inception. According to the regulations, waste should be; segregated and grouped according to their similarity for example plastics, toxic, organic etc; all waste should be deposited in a designated dumping area approved by the local authority; all waste handlers engaged by the proponent should be licensed by NEMA and possess all relevant waste handling documents such as waste transport license, tracking documents, license to operate a waste yard, insurance cover, vehicle inspection documents among others; all hazardous wastes should be labelled as specified in section 24 (1-3) of the regulation. The fourth schedule lists wastes considered as hazardous and solvents, emulsifiers/emulsion, waste oil/water and hydrocarbon/water mixtures.
EMCA (Noise and Vibrations Control) Regulations, 2009 provides guidelines for acceptable levels of noise and vibration for different environments. Section 5 of the regulation warns on operating beyond the permissible noise levels while section 6 gives guidelines on the control measures for managing excessive noises and copy of the first schedule indicating the permissible noise levels for different noise sources and zones. This Act is meant to ensure that all activities at least maintain ambient quality standards of air and any pollution to air (in particulate matter, dust or obnoxious and poisonous gases) needs to be sufficiently mitigated.
County Governments Act, 2012 delineates the roles and responsibilities of county governments with their administrations as well as the role of county citizens in public participation and consultations regarding projects at the county level.

Methodology

Sample size selection

The social impact assessment study adopted a descriptive survey design with the aim of describing the situation as it is at Mwakivunge. A sample size of 175 residents were selected by simple random selection from an approximate population of 500 people. The sample was selected from the seven villages as distributed below.

Table 1: Study Sample

Village	Sample
Dumpsite	40
Colorado	25

Gungombe	23
Marimani	22
Kambini	30
Mwakirunge	30
Total	**175**

The social impact assessment utilized a questionnaire (appendix 4), informal interviews and a focus group discussion to establish the impact of the dump site on the neighbouring communities.

Figure 1a: Participants in a focus group discussion

There was a revisit to map the number of villages around the dump site, familiarize with the local administration and relevant stakeholders concerning the study as well as a plan for the focus group discussion.

Figure 2: The pre visit

A day to actual data collection the questionnaire was piloted to ascertain clarity and add social issues that had not been captured. Thereafter data was collected in the six villages in the next five days.

Figure 3: Actual data collection

FINDINGS

Demographic characteristics of the population

Majority of those interviewed (figure 1) had attained primary education (62%) followed by secondary 24%) and tertiary (7%). This clearly indicates that the low level of education coupled with the negative compounding effect of the dump site as a hazard for overall development in Mwakivunge in a business as usual scenario hence the urgent need for mitigation of effects.

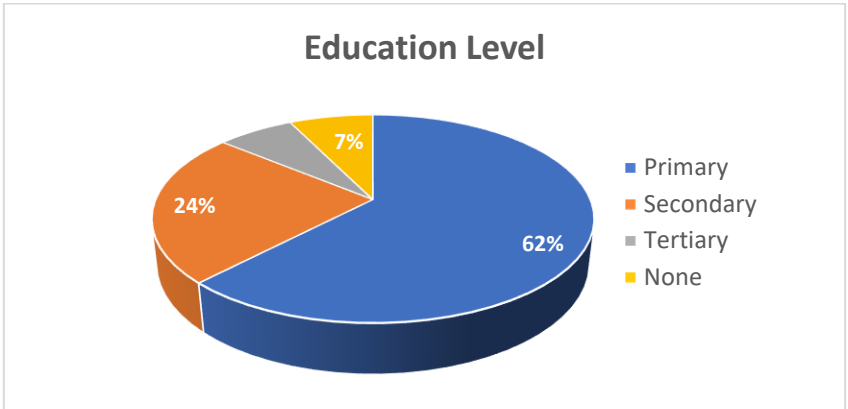

Figure 4: Participants level of education

Employment

In relation to employment status, most of the Mwakivunge residents are self-employed (47%), 38% are not employed while 15% have formal employment. The self-employment scenario mostly involved scavenging at the dump site to resale at the local communities or plastic dealers who come to buy the collections. For those not actively involved in the dumpsite, they engaged in farming, fishing, building and yet others in buying and selling of items used within the community. In our estimation, the phenomenon of self-employment largely refers to those within the least income bracket.

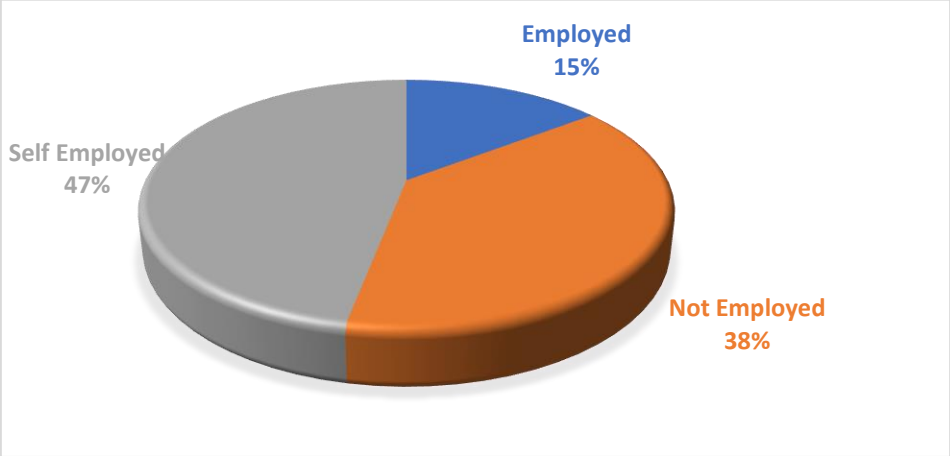

Figure 4: Employment status

Communities' interaction with the dump site

The study sought to understand the extent of the neighbouring communities engagement with the dumpsite in order to gauge if it is beneficial in any way to the communities. It was established that 73% of the residents did not have a role at the dump site, this constitutes mostly those living in Mwakivunge before the dump site was relocated from Kibarani to its current place. On the other hand, 27% had a direct interaction with the facility see figure 3. The latter, constituted those directly involved at the dump site as waste pickers mostly composed of dump site families that were relocated from Kibarani and whose livelihoods depend on the dump site.

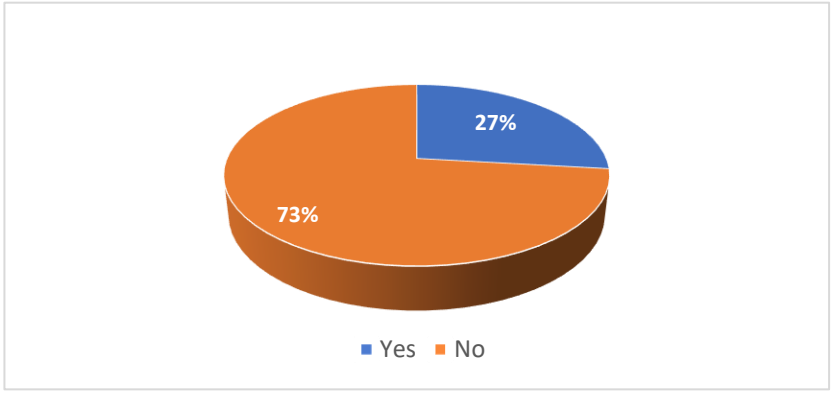

Figure 5: Role at the dumpsite

It is important to note that the dumpsite was relocated from Kibarani to Marimani in 2002 and finally moved to its present site in Mwakirunge in 2008. The current dump site has therefore been there for about 16 years approximately.

History of the community around the dump site

The assessment investigated the composition of the Mwakivunge community in terms of how they came to live there. From the study, it is clear that those born in the area occupied by the dump site (54%) is almost equal to those who moved there (46%).

Within the 54% of the inhabitants who migrated to Mwakirunge, majority bought land while a few were the community that had moved along with the relocation of the dump site to its present location.

The other 46% (figure 4) were living there by way of ancestral land or by birth. This last group is made of the most agitated group who were staying in a calm, clean and healthy environment until the dump site was relocated from Kibarani to Marimani and finally to its current location.

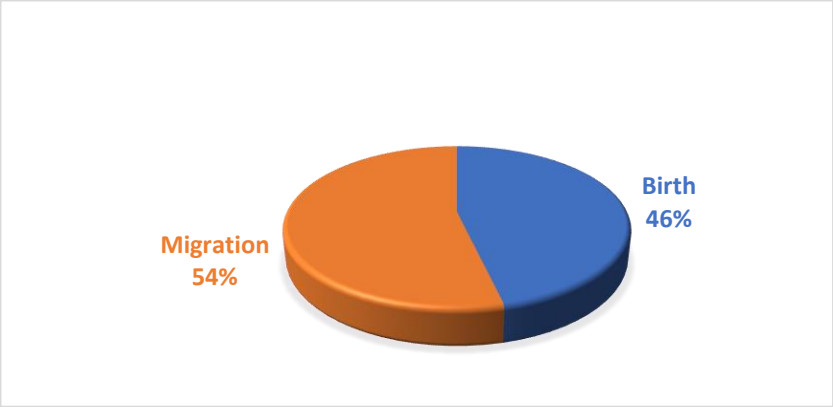

Figure 6: Settlement status

Indeed, the study established that those who had lived there for over 25 years constituted 46.3 % and were mostly made of those who migrated and those who live there by ancestral endowment. Those who have stayed there for less than 15 years mainly constituted the dump site migrants whose survival is pegged on it as shown in figure 5.

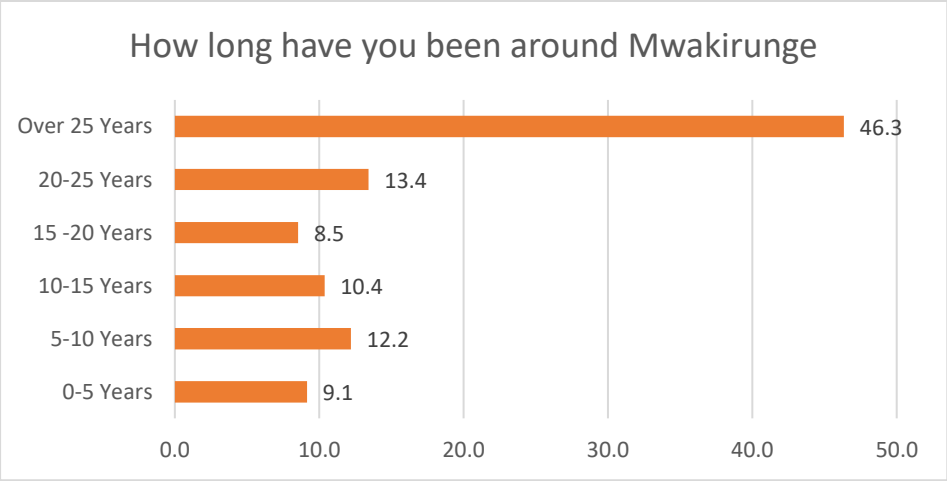

Figure 7: Years of stay at Mwakivunge

Major reasons for staying close by Mwakirunge dump site

The reasons for staying at Mwakivunge ranged from mostly; family affiliation to practising farming and work for others (figure 6).

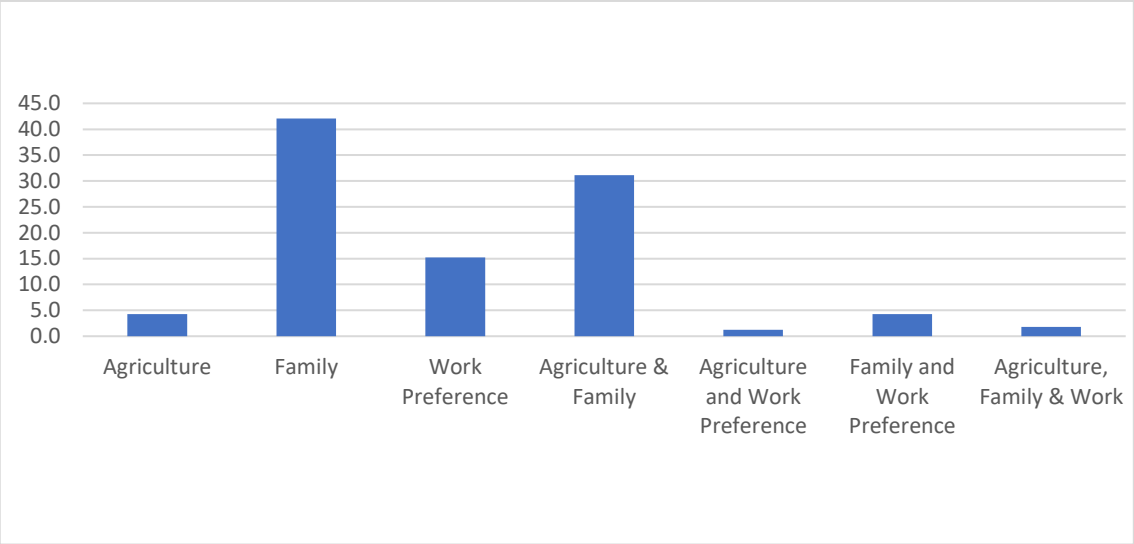

Figure 8: Reasons for living in Mwakivunge

While seeking views on the general effect of the dump site on peoples livelihoods, it was established that 79% of the respondents are affected while 21% are not. Those affected comprised mainly the native landowners and business people who were reeling from the impacts from the dump site.

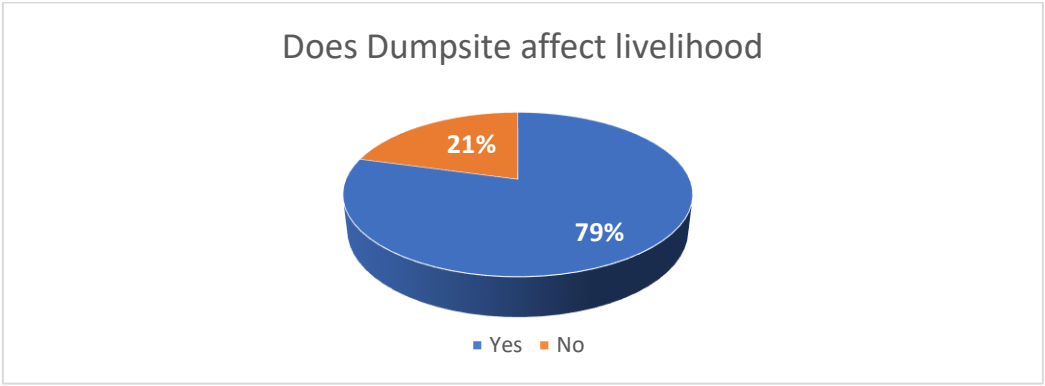

Figure 9: Effect of the dump site on livelihoods (the economic effect)

The assessment also inquired on the ramifications of the dumpsite on various stakeholders. The land users (75%) acknowledged the devastating fall in land value and subsistence agriculture as well as aesthetic value owing to smoke, bad odour and insecurity since the inception of the dumpsite.

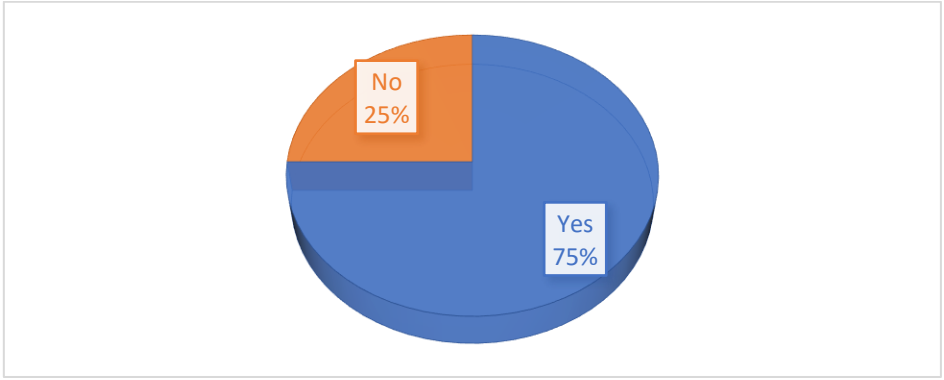

Figure 10: Effect of dump site on land users

Effect of the dump site on local businesses

In regard to the business operators (70%) indicated that the dump site had a negative turnaround of their businesses as some cheap contraband goods from the dump site found themselves in the market.

Figure11: Grains from the dumpsite awaiting resale

However, 30% affirmed that the dump site had no effect on their businesses. In fact the minority even think that the dump site is a source of increased business. A case in point is that of a private health clinic operator that thinks his business is doing well due to the negative effects occasioned by the dump site.

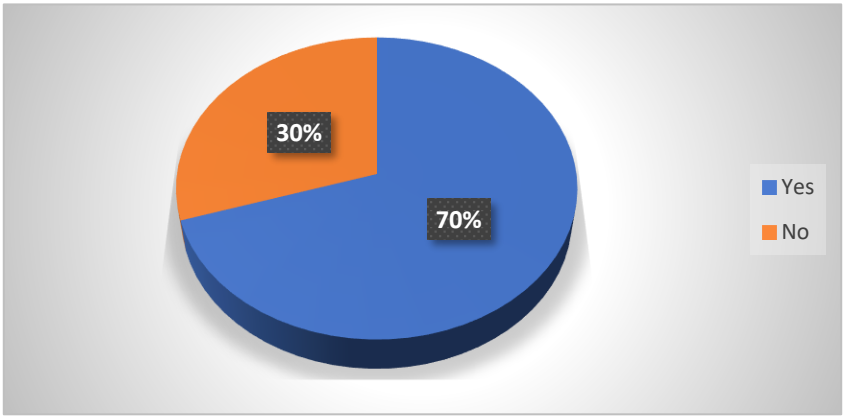

Figure 12: Effect of the dumpsite on private businesses

Social effects of the Dump site

The dump site had a profound negative effect on the elderly persons (93%) in figure 11 owing to heavy amounts of smoke and flies. This is mostly due to the reduced immune system.

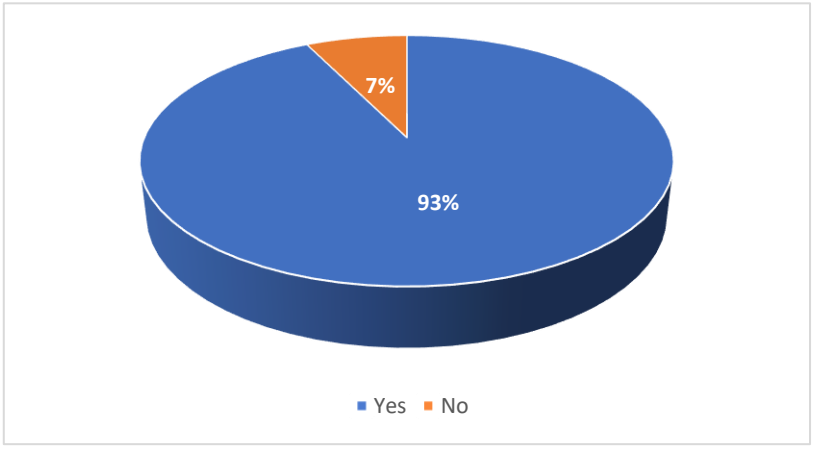

Figure 13: Effect on elderly citizens

Moreover, there is rampant inaccessibility of homes and vital infrastructure such as hospitals during the rainy seasons when the trucks get stuck along roads and discard waste making the roads impassable. It is important to note that the main road to assessing most of the communities like Colorado, Gungombe, Marimani, and Kambini pass through the dump site. In fact, many a times the main road is annexed to the dump site through waste over-flow. The same case was for disabled persons in figure 12 where participants registered 89% response. Boda boda operators were heavily affected during the rainy season as most suffered difficulties fending for families during the rainy season when the roads are impassable.

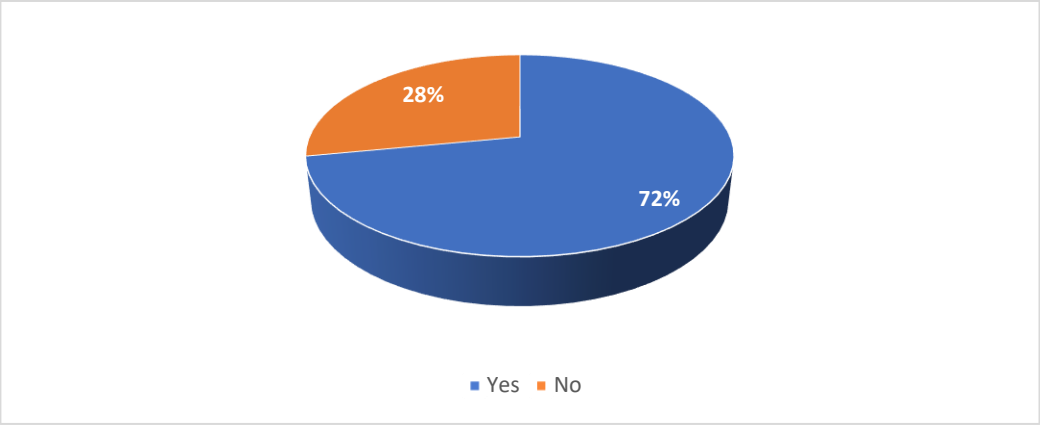

Figure 14: Effect of the dump site on main road users

Negative effect of the dump site on children

Most respondents registered their fears on the profound effect of the dump site on children and young people at 94% (figure 13). Many children accessed the dump site often since it is not fenced and got hurt by blunt objects as well as consumed contraband foods which at one point led to food poisoning. A number had found themselves into the drug abuse menace by involvement with the dump site families. Many women expressed personal insecurity, dangers of HIV infection from rape cases and marital problems owing to lures from waste kingpins. They also registered psychological distraught for their children owing to dangers along the way as they pass through the dump site (figure 14)

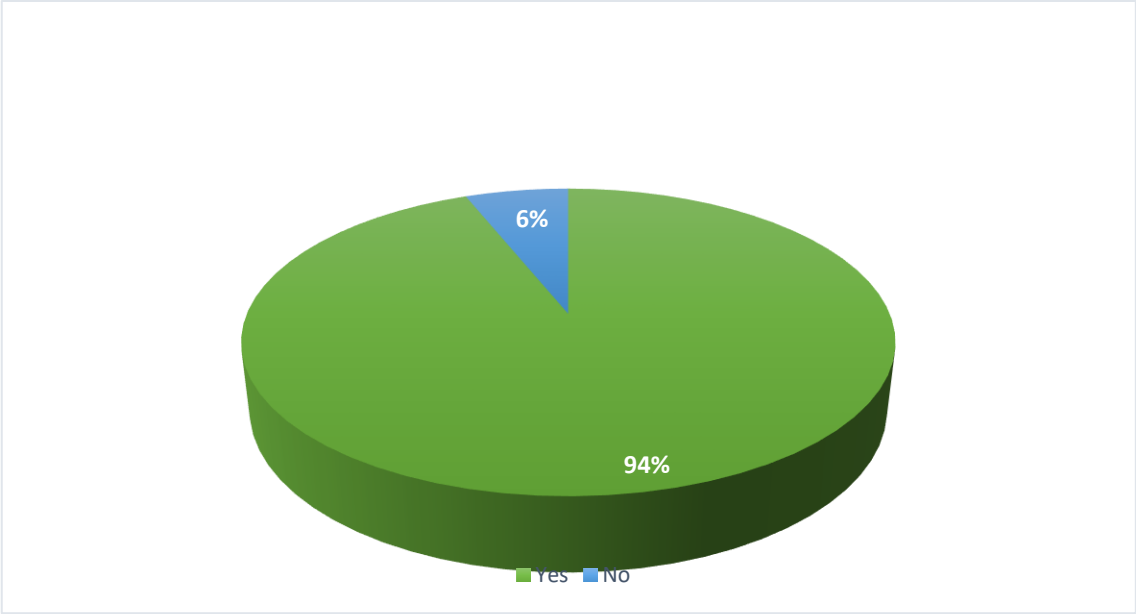

Figure 15: Negative effect of the dump site on children

Other social impacts associated with the dump site are summarized in table 2 below. This is further supported by findings in appendix 1,2 and 3.

Table 2: Other social effects from the Mwakirunge dump site

Effects that are directly associated with Dump site	Percentage impact of the
Health Challenges	95.1%
Pollution	98.8%
Littering	97.0%
Insecurity	88.4%
School Dropouts	96.3%
Death of Domestic Animal	82.9%
Family Breakups	85.4%
Child Delinquency (Moral Decay)	94.5%
Smoke	98.8%
Bad Smell	98.8%
Dust	98.8%
Snakes	70.1%
Scavengers Birds	97.6%
Wild Dog manace	90.9%
Flies	95.1%
Mosquitos	93.3%
Fires	81.7%

Most respondents experienced psychological distraught living near the dump site and passing there everyday due to the bad smell, litter, smoke and marauding youths. Many a inhabitant have often thought of relocating save for lack of options (table 3).

Any positive effects of the dump site

An inquiry on the positive effect of the dump site gave mixed reactions with 54.9% yielding and 45.1 not yielding. This is an indicator of the big divide albeit social stratification the dump site has created in Mwakivunge pitting the beneficiaries of waste collection against the native land owners that feel inconvenienced by its presence (appendix 1). The same question posed in a different way to establish the negative effect of the dump site gave 87.8% response for the negative effect of the dump site against 12.2% (appendix 2). Majority of the residents passed the dump site on daily basis (appendix 3) pointing to the extent of effects they were exposed to. Some of the positive effect of the dumpsite included; source of income for those who are willing to score through the garbage piles, source of goods for sale to some small case traders, hide outs for delinquents and those escaping responsibilities at home among others.

Mental effect of the presence of the dump site

Negative thoughts about environmental challenges is attributed to mental health issues.

Table 3: How often do you think living near dump site

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Daily	122	74.4	74.4	74.4
	Few times a week	12	7.3	7.3	81.7

	Few times a month	20	12.2	12.2	93.9
	Few times a Year	9	5.5	5.5	99.4
	Never	1	.6	.6	100.0
	Total	164	100.0	100.0	