Waste Disposal Management and Pollution Policies in Eldoret-Kenya

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Abstract: **Waste management or Waste disposal is all the activities and actions required to manage waste from its inception to its final disposal. This research endeavors to examine the waste disposal management and pollution policies in Eldoret municipality-Kenya. The paper will be guided by the following objectives: to examine the waste disposal and management policies in Eldoret municipality and to evaluate the roles of various stakeholders in waste management. The paper will adopt a qualitative approach by getting response from the stakeholders through interviews and questionnaires, the respondents were chosen through purposive sapling technique. The geographical scope of the study was Eldoret municipality while the time scope covered the period 2012-2015. The findings were: several policies exist which include; Waste Generation Policy, Waste Transportation Policy, Waste Disposal Policy, and Waste Recycling Policy. However, the implementation of the mentioned policies is wanting. The stakeholders include; Central Government, Judiciary, Legislature and Relevant State Corporations. The paper concludes that the presence of relevant policies and stakeholders should ensure proper management of solid waste and pollution prevention due to lapse garbage collection, lack of garbage collection in high density and inadequate facilities in city centers and low density areas also pose a challenge.**

Key words: **waste disposal management, waste management policies, pollution, stakeholders, Eldoret municipality**

I. INTRODUCTION

It is estimated that half of the world's population (47 per cent) lives in urban areas, a figure which is expected to grow by 2 per cent per year during 2000–15 (United Nations Population Division 2001). The accumulation of people, their consumption patterns, travel behaviour and their urban economic activities have a large impact on the environment in terms of resource consumption and waste discharges.

In the European Union, waste generation per capita from household and commercial activities, which constitutes only part of the total amount of municipal waste, already exceeds the target of 300 kg per capita per year set in the European Union's fifth environmental action plan (EEA, 2001) by 100 kg. Most European countries have recycling schemes, particularly for paper and glass although this development has been only a partial success because the generation of waste paper and glass has also increased. Sludge from urban wastewater treatment plants is estimated to have increased in the EU from 5.2 to 7.2 million tones dry solids during 1992–98, and further growth is expected (EEA, 2001).

Thousands of tons of solid waste are generated daily in Africa. Most of it ends up in open dumps and wetlands, contaminating surface and ground water and posing major health hazards. Generation rates, available only for select cities and regions, are approximately 0.5 kilograms per person per day in some cases reaching as high as 0.8 kilograms per person per day. While this may seem modest compared to the1–2 kg per person per day generated in developed countries, most waste in Africa is not collected by municipal collection systems because of poor management, fiscal irresponsibility or malfeasance, equipment failure, or inadequate waste management budgets (Johannssen et.al., 1999).

For health reasons, waste in tropical regions should actually be collected daily. This makes the challenges and costs of solid waste management in much of Africa even more daunting. It is generally the city center and the wealthier neighborhoods that receive service when it is available. In poorer areas, uncollected wastes accumulate at roadsides, are burned by residents, or are disposed of in illegal dumps which blight neighborhoods and harm public health. Present Manual Street sweeping by employees or shopkeepers may help reduce these effects in the most public areas. Nonetheless, roadside accumulation in many cities has reached levels resembling those that spawned epidemics in European cities 500 years ago. Unless a more effective urban waste management program is put in place, outbreaks of cholera, typhoid and plague may become increasingly common (Gopalan and Bartone, 1997).

Eldoret experiences several problems associated with environmental degradation. Being an urban setting, the municipality mainly deals with solid mass waste and the degradation include the following; increase in disease transmission or otherwise threaten public health, contaminate ground and surface water, create greenhouse gas emissions and other air pollutants, damage ecosystems, injure people and property and discourages tourism and other business.

Statement of the problem

The world's cities currently generate about 1.3 billion tonnes of solid waste per year and this volume is expected to increase to 2.2 billion tonnes by 2025, more than doubling in lower income countries (Global solid waste management report 2012).

Throughout most of Sub-Saharan Africa solid waste generation exceeds collection capacity. This is in part due to rapid urban population growth: while only 35 percent of the sub-Saharan population lives in urban areas, the urban population grew by 150 percent between 1970 and 1990. But the problem of growing demand is compounded by broken-down collection trucks and poor program management and design. In West African cities, as many as 70 percent of trucks are always out of service at any one time, and in 1999 the City of Harare failed to collect refuse from nearly all of its residents because only 7 of its 90 trucks were operational (ERM, 2000).

In Nairobi, Kenya only 25% of the solid waste generated daily is collected (Ikiara et al 2004). In Eldoret, the insufficient collection and inappropriate disposal of solid wastes represent a source of water, land and air pollution, and pose risks to human health and the environment. A high proportion of the waste collected is disposed in undesignated waste disposal sites such as roadsides, drainage systems and other public utility areas.

Several policies relating to curbing pollution, environmental degradation and waste disposal have been formulated. This research therefore, sought to investigate the challenges facing the implementation of waste disposal and pollution prevention policies in Eldoret.

Justification of the study

The study will highly contribute to knowledge on waste disposal and pollution policies in Kenya.

For policy makers and administrators, the study will provide momentum to the various importances of waste disposal management and pollution prevention policies in municipalities.

The study will highly increase awareness on the significance of waste disposal management and pollution policies on improving quality service delivery and efficiency by bringing service demand at the grass roots levels. For researchers and scholars, the study will be of great importance to the researcher as it will dispense route to acquire both theoretical and encounters on influence of fiscal decentralization on quality of health care services. Further, the study will fill the existing aperture on why waste disposal management and pollution policies must not exist for its own sake, but that it must yield to tangible outcomes that foster quality outcomes in Kenya.

II. METHODOLOGY

The paper will adopt a qualitative approach by getting response from the stakeholders through interviews and questionnaires, the respondents were chosen through purposive sapling technique

III. WASTE DISPOSAL AND MANAGEMENT POLLUTION POLICIES

Municipalities are at the areas of a further threat to the environment, namely the production of an increasing quantity and complexity of wastes. The estimated quantity of Municipal Solid Waste (MSW) generated worldwide is 1.7 – 1.9 billion metric tons (UNEP, 2010). In many cases, municipal wastes are not well managed in developing countries, as cities and municipalities cannot cope with the accelerated pace of waste production. Waste collection rates are often lower than 70 per cent in low-income countries. More than 50 per cent of the collected waste is often disposed of through uncontrolled land filling and about 15 per cent is processed through unsafe and informal recycling (Chalmin and Gaillochet, 2009).

Inadequate collection and disposal of municipal solid waste is a persistent urban problem in developing countries. Uncollected wastes end up in neighborhood dumps where disease-carrying insect vectors and rodents proliferate or in street drains where they can cause flooding and subsequent road damage, and traffic obstructions (Bernstein, 1995). Even where solid waste is collected, environmentally safe disposal facilities rarely exist. Wastes disposed off in open dumps are major sources of surface and ground water contamination, as well as air pollution (Nyakaana, 1995).

According to Nyakaana (1995), solid waste generated in the Eldoret is largely composed of two broad categories of waste: 1. Residential; 2. Commercial. Household waste contains mainly wet organic material. Currently in the municipality few households in the city are served by the municipality and others by private waste collectors while the remaining waste is disposed of by the generating households. Waste from markets is mainly raw vegetable matter, food refuse, and some scrap metal and other inorganic materials.

The other forms of solid waste are primarily commercial waste from offices, retail shops, warehouses and hotels. Industrial waste is composed mainly of packaging material, food wastes, metal, plastics, textiles and fuel ash. Street waste is generated from street sweeping and consists of sand, litter, drainage cleanings, animal fecal material and actual dead animals. Construction and demolition wastes include lumber, pipes, bricks, masonry and other construction materials from cleared building sites. Abandoned vehicles' bodies, as well as special waste generated from hospitals, slaughter houses and cesspool waste are problems of special importance. This type of waste calls for special treatment, handling and disposal strategies that are different from other tasks.

This sub-section discusses key environmental regulations which include the following: generation of waste, waste transportation, waste disposal and waste recycling as provided by Urban Areas and Cities Act (2011) and the Local Government Act (CAP 265) Council By-Laws 2009. In accordance to Urban Areas and Cities Act (2011) and with the section 205(i), 147, 154 and 201 of the Local Government Act (2009), the Municipality of Eldoret approved the following by-laws as regulation to govern the environment:

Waste Generation Policy

The research established that in Eldoret, the regulation prohibits waste generators which include industrial processes, markets, institutions, hotels, hospital facilities, domestic and the public from disposing any waste on the streets, roads, recreational areas and any other public place except in the designated places given by the municipality where disposing is allowed. From here the municipality does the segregation and collects the disposed waste for proper disposal.

Figure 1. Waste Disposed in Drainage System

Source: Eldoret Municipal Council, 2010

As established by the research, residents and business enterprises still dump their waste in drainage systems as shown in Figure 1 which is prohibited given that some disposal receptacles have been provided in strategic positions to allow appropriate dumping.

Waste Transportation Policy

The research established that transportation of waste from the point of generation to disposal site is an important aspect of waste management. Once the waste has been disposed in the designated waste receptacles, it is the work of the municipality to transport them to the disposal site. There are other private operators who also collect and transport the waste to the appropriate dumpsite that has been set aside by the municipality. Licensing and monitoring of waste transporters' is done to address environmental and health impacts of waste management activities through prevention of illegal dumping, prevention of land contamination, proper handling and disposal of wastes. Transportation should safeguard against the escaping of waste from the council's vehicles and also the private operators should observe the regulations which also include avoidance of scattering the waste.

Waste Disposal Policy

Under the waste regulations, the disposal sites are required to operate in environmentally sound manner whereby this will ensure proper and modern management of waste. Under the regulations, waste within the municipality's disposal site shall be treated in accordance with all the relevant legislations to ensure that such waste does not present any imminent or substantial danger to public health, environment and also the natural resources. Residential areas in urban centers generate more waste compared to rural households due to changing consumptions patterns (IPLA, 2011). The common type of domestic waste include kitchen waste, packaging materials and used items thus the municipality has to undertake waste segregation at the source to enhance waste disposal mechanisms for the ease of handling and recycling

Figure 4.5 shows Huruma landfill where all the waste from municipality is dumped. The policies prohibits waste disposal in any other place which does not meet all relevant legislations. The landfill is treated and maintained by the municipality to operate in environmentally sound manner.

Figure 2. Huruma Landfill

Source: Eldoret, Dept: of Environment, 2010

Radioactive substances in the municipality are guided by the provisions of the Radiation Protection Act (2007) in relation to the classification, registrations, labeling, packaging, transportation, importations, exportations and waste disposal, health and safety requirements with regard to radioactive substances. Disposal of radioactive substances are restricted to designated sites. Biomedical wastes are also available and regulations require that any person who owns or operates an institution that generates biomedical wastes should comply

with the regulations and also obtain EIA license from NEMA. The regulations state that segregated biomedical waste should be securely packed in biohazard containers which are clearly labeled with the symbols set out by the regulations. Industrial sectors are major contributor of waste in Eldoret; they are required by regulations to install pollution control technology for the pretreatment of the waste emanating from industrial undertakings (Urban Areas and Cities Act, 2011).

Waste Recycling Policy

Most recycling technologies in Kenya are either informal or rudimentary (Habitat, 2010). Traditionally, the common practice in Eldoret has been on the collection and disposal of waste without proper segregation at the source leading to mixed waste. In the municipality, some of the common recyclable waste include waste paper, plastic, glass, rubber sludge, cardboards and scrap metals. Recycling allows for material recovery for re-use, it leads to reduction of waste quantities and provides opportunities for income generation and employment. The principle of recycling allows for prior segregation of waste, proper disposal and reduced production cost due to material recovery

Figure 3. Waste Recycling

Source: Urban management and solid waste issues in Africa

In Figure 3, plastics are being sorted out from the dumb site to be recycled. This recycling allows re-use of the plastics which in turn reduces the amount of waste quantities. Recycling has also created opportunities for employment and generation of income given that after recovery they are sold.

IV. KEY ACTORS IN ENVIRONMENTAL POLICY IMPLEMENTATION IN ELDORET

Eldoret Municipal Council has several actors involved in the implementation of waste disposal and pollution policies, these include the following: the legislature, judiciary, central government and relevant state corporations.

Legislature

Waste disposal and pollution policies are derived from the Acts of parliament. In 2009, the parliament passed the Local Government Act that allowed municipalities to formulate council by-laws to govern environment and other departments. Legislature plays a critical role in the formulation of Acts that is by scrutinizing in the parliament before they are passed and implementation of policies through the Ministry of Local Government to ensure that all the outlined policies are exercised accordingly.

Judiciary

Court has been a major in the administration of policies. All problems arising from public policies in Kenya end up in courts for interpretation giving it an upper hand in all issues associated with policy. Courts play important role in implementation of environmental policies for example in Tanzania where the only “dump site” in the city was closed following an August 1991 court ruling in favor of residents of the Tabata area who complained of air pollution caused by burning waste dumped at the site (EGSSAA, 2009).In Eldoret court plays a major role in the implementation of environmental policies, the research found out that the law breakers are always arraigned in court for not complying with the given policies that governs the protection of the environment. Eldoret Municipal has not been left out, the council was taken to court for negligence of Huruma dump site. The research revealed that in 2009, Huruma dump site had been neglected by the municipality forcing the residents to form a “pressure like” group that sued the municipality in the law courts for negligence. The court ruling was given giving the municipality instructions to clear up the mess and operate in environmental sound manner.

Central Government

Ministry of Local Governments and the Ministry of Environment and Natural Resources play a greater role in the implementation of waste disposal and pollution policies not only in Eldoret Municipal Council but also nationally. Ministry of Local Governments is one of the major actors; it is the major avenue towards legalizing of these policies which are often called acts as per the municipalities. Once the policies have been formulated, the municipality will forward them to the ministry where the minister in charge will take them to the parliament for approval. Once approved the ministry will send back the policies back to the municipality in form of acts same to environmental policies. Ministry of Environment and Natural resources is also another important actor given that environment issues arising in Eldoret has to be addressed with the help of this ministry if it is that complicated that may end up causing conflict among several parties.

Relevant State Corporations

NEMA is a state corporation mandated with foreseeing all environmental matters in the country. In Eldoret, the research found out from the respondents that NEMA plays a critical role in implementation of environmental policies in various like: In order for private collectors to transport the waste as the municipality itself does, they have to obtain transport license from this authority which they should indicate their routes and a dully filled tracking document provided by the same authority to facilitate monitoring make it easier for law enforcement in case of irregularities. NEMA also plays another important role issuance EIA license to the institutions that own or operate any institution that generates bio medical wastes. Disposal of radioactive substances are also restricted to designated sites that should be approved by the authority. NEMA also prohibits activities likely to generate any hazardous waste without valid EIA license. NEMA's office is located within the municipality and it ensures that some of the environmental regulations are observed which are closely intertwined with municipality's regulations that are contained NEMA's Waste Management Regulations, 2006. The general provisions of the regulations include: waste generation, waste transportation, waste disposal and waste recycling.

V. CONCLUSION

Emanating from the findings, it can be concluded that solid waste management and pollution prevention policies do exist in Eldoret Municipality. It is up to the relevant authorities to ensure that the provided guidelines are fully followed to ensure proper waste disposal and pollution prevention with the help of key actors in sector.

Emanating from the findings of this study, it can be concluded that solid waste in Eldoret is made up of organic wastes (food and garden wastes) mainly associated with household and market waste; broken glasses, plastics, polyethylene, rubber, scrap metal, wood, paper and other inorganic wastes associated with the industrial and commercial sectors. Eldoret Municipal Council which is charged with the responsibility of collecting all the garbage in the town and its environs has provided communal bins at specific points. These communal bins are supposed to be emptied twice week, but unfortunately this rarely happens so they end up overflowing, thus making the surroundings an eyesore. Business operators are fond of sweeping part of their solid waste onto the pavement in the evening in anticipation that the street cleaners will collect it in the morning. High density residential areas are not provided with garbage collection services. In these environments individuals dispose of their household refuse in shallow holes where available and bum it.

Otherwise solid waste is thrown in any open space as the residents seem to employ the notion of "not in my back yard" (the area beyond the back yard in this case could even be less than five meters: from the doorstep). Those with gardens throw it there, unsorted, and this is environmentally unfriendly especially with plastics and polyethylene papers which do not decompose, and they even inhibit water penetration into the soil. Even in the city center, medium and low density residential areas waste disposal and collection facilities are inadequate so that solid waste is put on the roadside, illegal dumps, rain water drains, alleys and backstreets where it is expected to rot or be removed by the municipal council cleaners. Increasing population densities and overcrowded housing, coupled with poor layout plans make access into certain areas of the city less feasible, and this encourages solid waste accumulation rather than disposal. The failure by the Eldoret Municipal Council to collect all the solid waste has attracted a new wave of immigrants such as the marabou storks, rats, flies and other rodents.

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