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RESEARCH ARTICLE

MANAGING HUMAN WASTE FOR A BETTER URBAN ENVIRONMENT IN LOW INCOME RESIDENTIAL AREAS: THE CASE OF ELDORET TOWN, KENYA

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ABSTRACT

Kenya is urbanizing rapidly with a population growth rate of 8% per annum. Currently, 35% of the country's population lives in urban areas. This is estimated at 60% by the year 2030. This urbanization, if not properly managed, implies significant dynamics that impact negatively on the urban environment. The situation is worse in dense residential areas of urban centres, where the main environmental challenge is the proper management of wastes. Hips of garbage are common in low income areas of most Kenyan towns, Eldoret included. In most cases, uncollected wastes, often mixed with human and animal excreta, are dumped indiscriminately in the streets and drains. Such acts lead to contamination of surface and ground water through leachate and soil contamination, hence the spread of water-borne diseases such as cholera and dysentery. The discharge of untreated or inadequately treated human wastes from dwelling places and raw sewerage often harms the environment and human health. Based on the study carried out in Eldoret town, this paper critically analyses and identifies problems of the human waste management systems in low income residential areas of the town, and makes recommendations towards a more sustainable urban environment.

INTRODUCTION

As is the case in most African countries, Kenya is urbanizing rapidly. For instance, whereas an estimated 20.4% of the country's population resided in urban areas in 2005, by 2010 this figure had risen to 30.4% and is expected to rise to 60% by the year 2030 (ROK, 2007). This rapid urbanization, if not properly managed, implies significant dynamics that impact negatively on the urban environment leading to serious environmental impacts. This situation is worse in high density residential areas of the urban centres in the country. One of the main environmental challenges in these parts of the town is the proper management of waste. Human activities create waste, but it is the way these wastes are handled, collected, stored and disposed of which pose risks to both the environment and the public health (Alexis, 2010). Where intense human activities concentrate, such as in urban centres, appropriate and safe waste management are of utmost importance to allow healthy living conditions for the population. In most developing countries, one to two-thirds of the wastes generated are not collected (Wilke, 2006). As a result, the uncollected waste, which is often also mixed with human and animal excreta, is dumped indiscriminately in the streets and in drains, in the process contributing to breeding of insects and rodent vectors and the spread of diseases (Staniskis and Stasiskiene, 2005).

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Most of the human waste in the Kenyan urban centres is disposed of in an inappropriate manner and this creates environmental degradation and pollution. The environmental degradation caused by inappropriate disposal of human waste is expressed by the contamination of surface and ground water through leachate, air pollution and spreading of diseases. According to World Health Organization (2006), over 3million people die throughout the world each year from water-borne diseases caused by water sources being contaminated by raw sewage. This toll is greater than the combined loss from war, terrorism and use of weapons of mass destruction. To prevent the detrimental effects of human wastes, it is essential that these wastes be properly managed in an environment friendly approach. In Kenya's main urban centres, it is the urban poor residing in high density low-income areas who suffer most from the life-threatening conditions deriving from deficient human waste management (Obabari, 2009). The need for genuine and organized initiatives in human waste management in high density urban settlements has been regularly voiced in Kenya (Kirimi, 2008). With the emerging concern over the large quantities of human waste being produced both in the form of faeces and urine, the concept of waste management becomes one of the key focus of sustainable urban development. As is the case in most urban centres in Kenya, over 60% of Eldoret town's population live in low income, high density residential settlements. These settlements include Boma Turkana, Huruma, Kambi Somali, Kamukunji, Kimumu, Langas and

Munyaka. Human waste is a severe threat to public health concerns and general cleanliness. Although the form of wastes generated in these settlements is predominantly organic and biodegradable, they are a major problem to the overall sustainability of the ecological balance. The discharge of untreated or inadequately treated human wastes from dwelling places, industries, agricultural activities and raw sewerage often causes pollution or causes harm to the environment and human health. These harms come in the form of undesirable changes to the ecosystem, reduction in the economic value of resources, environmental pollution and human health risks. Poor human waste management leads to negative economic impact. Health related impacts include costs due to absence from work, costs of medical treatment and even loss of life. In addition, an outbreak of a serious disease like cholera can cost millions in lost earnings. Despite these serious consequences that arise from poor management of human waste, it is of concern that currently there are no serious efforts to address the situation, particularly in high density low-income residential areas where majority of the urban dwellers reside. This paper gives a situational analysis of human waste management systems in low-income settlements within Eldoret municipality. The paper identifies key challenges with respect to human waste management in the settlements and provides viable and sustainable ways of addressing this depressing environmental situation on our urban centres. This is in an attempt to contribute towards the attainment of appropriate living and sustainable urban environment in the country.

Human Waste Management and Environmental Sustainability

Human waste is a by product of digestion such as faeces and urine. It is most often transported as sewerage in waste water through sewerage systems (Elkington and Shopley, 2009). It is a bio-waste and can be a serious health hazard, as it is a good vector for both viral and bacterial diseases. Effective human waste management is crucial to ensuring appropriate and safe disposal of human waste. In this case, human waste management is an ongoing health and environmental issue that needs constant vigilance and maintenance. Waste management involves collection, transportation, processing, recycling or disposal and monitoring of waste materials. Effective human waste management is crucial to ensuring the appropriate and safe disposal of human waste. Currently, managing solid waste in general and human waste in particular is one of the biggest challenges to Kenya's urban centres. From a global perspective, the management of human waste between the north and the south differ greatly. Virtually the entire population of the north use improved sanitation. The majority of the people living in urban centres in the north do not have to worry about their waste. Like garbage that is whisked off the curb each week, their human waste is often washed away with one push of a handle. The path the waste travels thereafter is often unknown to most. The waste is managed, treated and cleaned so that the resulting liquid can be ejected into river systems (Kazemi and Eek, 2008). In other instances, the wastes are treated and recycled and used for agriculture, parks and community gardens. Any problems here would be with the maintenance of the human waste management system.

For the majority of the urban dwellers in the south, the situation is quite different. According to the UN Water Decade Programme on Advocacy and Communication (RNW-DPAC), two million tonnes of human wastes are disposed of into water bodies' everyday in major cities of developing countries. In some African countries, human wastes are generated but suffer from problems of management (Akinbode, 2002). Among the 2.6 billion people in the world who do not use improved sanitation facilities, by far the greatest numbers are in southern Asia and sub-Saharan Africa. Human waste management has been an intractable problem in recent times beyond the capacity of most municipal and state governments. In Ghana, for instance, 70% of the urban population shares sanitation facilities with population living within slums without proper waste management systems. The problem of waste management and particularly human waste management is worse in slums and squatter settlements.

The discharge into the environment of inadequately treated human wastes may result in bacterial contamination of waters and exposed biota (Gertsakis and Helen, 2003). Discharge may be via sewer outfalls or via seepage from septic tanks and other toilet types. Human sewage contains enteric bacteria pathogens, viruses and eggs of intestinal parasites. Human pathogens that cause sulmonellosis, typhoid fever, hepatitis, cholera, dysentery and various gastrointestinal diseases may be released into the water and transmitted to new hosts by contact (bathing and swimming) or by consuming contaminated biota (Forbes *et al*., 2010). Pathogens in waste water may also be transmitted by direct contact with sewage such as playing in a yard with failed septic system or coming in contact with animal waste or via drinking contaminated water or coming in contact with insect carriers (Posey, 2005). Drinking water may also become contaminated as a result of contamination of aquifers through seepage from septic tanks and water seal toilets, pollution of catchment areas from animal waste and poor sanitation practices in general. Poor management of human wastes can also affect ground water ecosystems. For sustainable urban development, what is required is the development of zero-discharge urban waste water management strategies, as this will contribute to a reduction in pathogenic contamination of surface and ground water and aid in protecting the vitality of urban dwellers. Organic waste recovery can result in production of inputs for urban agriculture, enhance food security and link different sectors of the local economy. Decentralized organic waste recovery systems that integrate the best available low income technology in the recovery of urban domestic waste water flows are essential and appropriate components in the urban ecosystems health strategy (SOPAC, 2002).

Within the next 20 years, 60% of the world's population will live in cities with the most urban expansion taking place in the developing world, particularly in Africa. This is emerging as real challenge which requires immediate attention and hence the need to address the issue of human waste management in a sound, environment friendly and sustainable manner. Turning to Kenya, the management of solid waste in general and human waste in particular has not been very impressive. For instance, only 32 out of 178 designated urban centres in the country (representing just 18%) have a sewerage system. This means that 142 designated urban areas (representing 82% of the urban areas around the country) do not have access to any

form of sewerage system and are therefore highly exposed to environment related diseases. The situation is worse in informal and low-income residential areas. Taking the case of Mukuru slums in Nairobi with a staggering population of well over 600,000 people, the sanitation conditions in this part of the city almost constitute a human crisis. The conditions in Mukuru are appalling: lacking basic drainage disposal facilities and clean water supply. Worse still, most of the wastes generated drains into the Ngong River which transverses right through the middle of the slum leaving it almost choked with litter and highly contaminated (Omondi, 2000). The environmental effects of poor human waste management are becoming evident in most urban centres in Kenya (Gilbert *et al*., 2003; Gregory, 2005; Gandy, 2009). These contaminants can cause serious and long-term pollution of land, air and water. Elevated BOD in effluent reduces dissolved oxygen levels in receiving waters, reducing survivorships of many organisms. It is evident that there is a lot of waste, including human waste, which is generated in the urban centres in Kenya that need to be managed. There is also evidence that there are weak management initiatives that cannot effectively manage waste in urban centres. The situation is dire in the low-income high density residential neighbourhoods. From the foregoing, we can note that waste management in general and human waste management in particular is a global problem, although this problem is worse in developing countries, especially those that are resource scarce. In most of these countries, Kenya included, improper management of human wastes has had serious health and environmental impacts in the process negatively affecting the urban environment. The problem is worse in low-income high density residential areas where the majority of the urban dwellers live.

METHODOLOGY

This paper is based on a study which used a multi-technique survey design based on various targets groups. This helped to establish an insight on the phenomenon of human waste management and derive some understanding of the constructs involved. It was both descriptive and analytical in nature. Both qualitative and quantitative research was done to provide an insight into the state of human waste disposal in the low-income residential areas within Eldoret town. The main data collection techniques used in the field included questionnaires, direct observation; key informant interviews, focused group discussions, and a house hold survey.

RESULTS AND DISCUSSION

Ownership

In the surveyed residential settlements, 80% of the residents lived in rented houses while 20% lived in self-own houses. Thus majority of the residents paid rent but had no direct control of the environmental infrastructure in the settlements. In essence, they just had to cope with the conditions that were made available by their land lords, even if they (the conditions) were not conducive. Majority of people in these settlements lived in rented premises. The normal plot sizes in these settlements were a quota acre. A landlord would construct sixteen single units on the plot with two pit latrines to be used by the residents on the plot. Assuming an average family size of 6 members, this meant each toilet was serving approximately 48 persons. This sharing of the facility had a bearing on the maintenance, care and cleanliness of the facility. Another important aspect was the availability of water in the settlements. This is because there is a direct relationship between water availability and human waste regime. For instance, some methods of human waste management such as sewer lines cannot work without a reliable source of water. Only 49% of the respondents had access to piped water. These meant that 51% of them would find it difficult to use sewer lines as a form of human waste disposal because of the absence of a dependable water supply. Sixty percent of the respondents experienced irregular water supply. The regularity of water supply has a bearing on the state of human waste disposal in any settlement. This is because water is needed to maintain the hygiene status of the waste disposal facilities.

Main Mode of Human Waste Disposal

The main facility for human waste disposal in the settlements was the pit latrines at 84%. Given the kind of settlements and the fact that the water source was not reliable, most of the households would be expected to use pit latrines for purposes of disposing of human wastes. A few had septic tanks at 5% while the remaining 11% depended mainly on open defecation. There was poor excreta disposal in these residential areas. Most of the residents used pit latrines that were poorly constructed not properly maintained and were constructed near water sources mainly wells and boreholes. Some of the facilities were full and thus discharge their effluence into the environment. These realities pose a great challenge and problem to human health. Since the pit latrines are constructed near boreholes, given that the water table is high and given the topography of the area, leaching was an obvious consequence. Secondly, most of the pit latrines were shallow and, therefore, it became easy to release the waste into the environment. This meant water was easily contaminated and thus prone to be infectious to the users. Indeed, it was evident that the most common diseases in these residential areas were waterborne, i.e. typhoid, fever, gastro enteritis, malaria among others. These are diseases mostly caused by poor management of the environment. Health is a crucial aspect of human existence. When health is compromised it threatens the very existence of the human person and other elements within his/her ecosystem. Human waste disposal can pose a great threat to the general health and to the environment if not managed properly.

Hygiene

One of the points of interest was the level of hygiene, privacy and convenience of these facilities. Most of the facilities would at best be described as poor and in a deplorable condition. Where there was no privacy, most of the users would not bother about the facilities' hygiene. This can be very detrimental to the overall sanitation, health status and the environment in general. Furthermore, the high number that used these facilities meant that at certain times of the day, especially in the mornings, people had to queue to use the facility. This was not only inconveniencing to the users, but also to a certain level embarrassing.

Actors

Five main actors were involved in human waste management in the settlements. These were: the residents, ELDOWAS,

Honey Suckers, NEMA and Eldoret Municipal Council. One of the main actors involved in human waste disposal were the users of the facilities for human waste disposal. The level of sanitation and general cleanliness of the facilities basically depended on the actions of the users. The other main actors were the honey suckers. These are private operators who had joined HWM human activities. They mainly emptied facilities for disposal of human waste in individual-owned premises and in institutions. The honey suckers were essentially private entrepreneurs who saw HWM as a business opportunity and sized it. The other actor involved was the Eldoret water and Sewerage Company (ELDOWAS). The company's mandate is the provision of services related to water and sewage to the town residents. ELDOWAS is therefore responsible for the supply of water, construction and maintenance of sewer lines. Since most of these settlements were not sewered, the activities of ELDOWAS were minimal. The last main actor in HWM was NEMA. This is a body that is mandated to ensure that every Kenyan has access to a health and living environment. NEMA works in conjunction with other stakeholders in the environment sector to ensure that it is safe and that all environment threats are addressed. In the residential areas, this agency was in charge of licensing honey suckers, watching over HM disposal facilities as well as ensuring that human waste management was done in an environment friendly manner. However, in the area under study, the agency was basically non-existent.

CONCLUSIONS AND RECOMMENDATIONS

By way of conclusion, we note that there is need for proper human waste management to avoid pollution, environmental contamination and to reduce health risks. Towards this end, we make the following recommendations with respect to human waste disposal in low income residential settlements in Eldoret town:

- The level of sanitation and the cleanliness of the facilities basically depend on the residents. They are thus crucial to the overall success of human waste management initiatives in the low-income high density residential areas. It is thus recommended that with the help of the Municipal Council and NEMA, residents be assisted to form waste management committees from amongst themselves. These committees would work closely with the Public Health Department of the Council and NEMA to maintain minimum acceptable levels of sanitation and hygiene in the settlements.
- Most of the practices that lead to poor sanitation in these settlements have to do with either ignorance of the dangers of such practices on the part of the residents or just bad habits. There is need for awareness campaigns on the ills of such practices by the Council, NEMA and other stakeholders with a view to changing the attitudes of the residents of these settlements towards more environment friendly waste disposal practices.
- The most commonly used facility for HWM in these settlements is the pit latrines. The pit latrines vary in sizes, shape and mode of construction. For this facility to be convenient and environment friendly, it must be well designed and constructed in accordance with health and environmental requirements. Hence, it is recommended that the Council comes up with standard improved VIP latrines and enforces their development throughout the low income residential settlements.

REFERENCES

Akinbode, A. (2002). *Introductory Environmental Resource Management*. Ibadan: Ltd.

Alexis, K. L. (2010). Determinants of approval of a recycling system. *Japanese Psychological Research*, 47(1): 1-11.

Elkington, J. and Shopley, J. (2009). *Cleaning up: Us Waste Management Technology and Third World Development.* World Resources Institute, a Centre for Policy Research.

Forbes *et al.* (2010). *Integrated Solid Waste Management: A Life Cycle Inventory*. Blackwell Science, p. 513.

Gandy, M. (2009). *Recycling and the Politics of Urban Waste: Option for Developing Countries*. London: Earth Scan.

Gertsakis, J. and Helen, L. (2003). *Sustainability and the Waste Management Hierarchy.* A discussion paper. Ecorecycle Victoris downloaded from http://www.ctd.rmit.edu.au/content/download/189/1390/file/sustainability%20 and 20%waste %20waste%20 hierarchy.pdf on June 15, 2007.

Gilbert, R., Don, S., Herbert, G. and Richard, S. (2003). *The Role of Local Authorities In The Urban Development in Kenya.* London: Earth Scene Publication Ltd.

Gregory, (2005). A Review of the Standard of Wastewater Treatment. *Journal of Hazardous Materials,* 122: 12-19.

Kazemi, A. and EeK, D. (2008). Promoting cooperation in waste management via participatory approach. In Biel, A., Eek, D., Garling, T. and Gvstafsson, M. *New Issues and Paradigms in Research on Waste Management*. Springer. New York City: University of Indonesia, Depok.

Kirimi, N. P. (2008). *Management of Municipal Wastes in Kenya especially in the Urban Areas with High Population Density*. A report presented to the 4th annual conference of town management doula Cameron, 4th July.

Obabori, A. O. (2009). An appraisal of the concept of sustainable development under Kenya law. *Journal of Human Ecology*, 28(2): 135-142.

Omondi, L. O. (2000). *Nutrient Status of Eldoret Municipal Sewage Plant*. Unpublished Dissertation Moi University, Kenya.

Posey, D. C. (2005). *Willingness to adopt a Structural solution in a resource dilemma under complete uncertainty: The Effect of Outcome-desirability bias, Procedural Justice, and Consideration of Future Consequences.* Dissertation.

Republic of Kenya (2007). *Kenya Vision 2030: A globally competitive and prosperous Kenya*. Nairobi: Ministry of Planning and National Development, Office of the President.

SOPAC. (2002). Regional meeting of stakeholders in wastewater management 10-15 October, 2001, Majuro Marshall Islands. *SOPAC Miscellaneous Report*, 451.

Staniskis, J. and Stasiskiene, Z. (2005). Industrial waste minimization experience from Lithuania. In *Waste Management and Research,* ISSN 0734-242x. Sage Publications.

Wilke, H. A. M. (2006). Greed, efficiency, and fairness in resources management situations. *Europea Review of Social Psychology*, 2: 165-187.

WHO, (2006). Guidelines for the Safe Use of Wastewater, Excreta and Greywater, Vol 4: *Excreta and Greywater Use in Agriculture*. Geneva, Switzerland: World Health Organization.

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