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Urban Sprawl: A Cause of Concern for Solid Waste Management in Peri-Urban Areas: A Case of Emthunzini Township in Bulawayo, Zimbabwe

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ABSTRACT

Solid waste management (SWM) constitutes one of the most crucial health and environmental hazards facing communities in peri-urban areas of Bulawayo. Bulawayo was once labeled as the cleanest city in Zimbabwe, however a lot need to be desired as the population grows and as the city expands. A lot remains to be done if the living standards of the peri-urban dwellers are to be improved. The expertise, both local and foreign, should be compatible with norms and custonnnms of the potential users, customers of the proposed services. Perhaps optimum results could be obtained by involving the target population for example in managing their water supply and sanitation as well as solid waste.

As a result of the increased in-migration and increase in consumption levels amongst people in Bulawayo, there is a sharp increase in the volume and also in the variety of solid waste. This has severely affected the peri-urban areas that lack proper municipal services. It is important to alleviate societal concerns over the increased rate of resource consumption and waste production; thus, policy makers have encouraged recycling and reuse of waste materials. This paper has interrogated the challenges of solid waste management in Bulawayo peri-urban areas, factors that lead to improper dumping of waste and proposed waste mitigation measures in Emthunzini peri-urban areas of Bulawayo.

Data for this study was collected through an in-depth interview with the household head.

Primary data was gathered from questionnaire surveys, guided interviews, photograph shooting and direct observation. Secondary data was gathered through desk study of documentary sources such as electronic publications, old newspapers, and library sources. The study used pragmatists ideology where both qualitative and quantitative data was used triangulated with secondary data sources. The research findings indicate that the major challenge of poor solid waste disposal is no refuse collection services offered by Umguza rural district council. There is massive debate between Bulawayo city council and Umguza rural district council over the ownership of land. The rural district on which Emthunzini falls under, have conflicting interests with the city of Bulawayo especially considering the fact that the city needs land to accommodate expansion yet the district is worried about loss of revenue base if Umguza plots are taken away. Therefore, this has triggered both parties to be on standstill concerning services like road rehabilitation, water supply, sewage waste management and solid waste management. The article finds that the service providers have continuously failed to provide adequate, regular, effective and efficient waste management services, particularly refuse collection. There is lack of proper refuse collection services at Emthunzini township. As a result, the majority of residents were forced to adopt alternative means of waste disposal, most of which were not environmentally friendly. Among other methods, residents relied on burning, burying, composting, recycling or reusing and illegal, the collective impact of which has been to create excessive illegal dumps in the streets, drainage systems and such other sensitive areas. There are various negative effects to the environment of illegal dumping of waste at Emthunzini that were cited by the households. Dumping of solid waste in these suburbs has been associated with health risks and hazards. This paper concludes and recommended that this state of affairs would persist if national government does not provide support to local authorities to ensure that it could mount educational campaigns, implement and enforce all applicable legislation, secure adequate resources for safe and adequate waste management as well as embark on innovative techniques, in collaboration with the private sector.

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Introduction

Solid waste management has been topical, both in scholarly and practitioners debates worldwide since the 1970s [1]. It has been a major challenge experienced with urban cities being the most affected places. This is a challenge that is most affecting the peri-urban areas nowadays due to urban sprawl. The worst is feared if this challenge is not addressed with urgency. The urban population in developing countries is growing at an alarming rate which is a cause of concern for solid waste management. The rapid pace at which urbanization has taken place over the last years has placed tremendous strain on local authorities' resources, resulting in failure to provide adequate services [2]. The present urban infrastructure can hardly cope with the current population growth.

Rural to urban migration is on the rise, triggering the expansion of built-up areas towards the peri-urban zones of cities. As a result, most of the services such as water supply, sanitation and solid waste management are strained to their limits. The assertion by substantiates that the environment should be used sparingly bearing in mind that the earth is fast reaching it carrying capacity [3]. Therefore, there is need for an overarching approach in solid waste management for sustainable development.

There is severe land degradation in urban and peri-urban areas which result from poor solid waste management. Pollution and solid waste management in urban areas have emerged as the major challenges requiring urgent attention [4]. In support of this assertion, state that waste management remains a great challenge in developing countries aggravated by limited resources [5]. Modern technology has been adopted but proven to be of not much help due to inappropriate equipment and facilities. Where service providers such as such as Emthunzini township in periurban areas of Bulawayo do not have the capacity to provide regular and effective waste management, residents are inescapably exposed to public health risks and hazards. The failure to collect refuse, became a grave concern for residents where heaps of illegally dumped waste was a common feature of pathways and storm drains. In addition, decomposing garbage and solid waste created sources of food and habitats for rats, rodents and disease vectors, which ultimately caused serious public health hazards. Solid waste management is essential to public health and environmental protection and need to be treated as a matter of urgency.

In as much as the urban areas are experiencing the waste management challenges, solutions should be crafted and implemented from grassroots level guided by enacted policies of the land. This means that the concerned local authorities shall play a pivotal role in advocating for proper or sustainable solid waste management within their communities. To achieve this, notes, appropriate environmental behaviors need to be inculcated. Local governments should, therefore, work hand in glove with their communities from policy making and implementation for sustainable solid waste management [6]. A radical and overarching approach is needed to curb challenges of waste management. This article investigates the effects of urban sprawl which is a cause of concern for solid waste management in the peri-uban areas of Bulawayo. Emthunzini township was used as a case study. The study was designed to establish the state of service delivery in the suburb, the causes of poor solid waste management, the impacts of poor solid waste management and to identify and determine alternative waste management practices used by residents.

The Concept of Peri Urban

The terms, peri-urban refers to the urban fringe and the geographic edge of cities as a place. It also refers to the interface between rural and urban activities, institutions and perspectives. Specific feature that has been identified as characterizing peri-urban is agricultural activities. Indeed, as typified by many African cities, households closest to the city practice intensive agriculture and it is the greater part of their livelihoods. Overall, the peri-urban is still conceptualized as a heterogeneous mix of urban and rural features. These mixed features are dominated by a whole range of high, and often increasing, population density, small landholdings, rich countryside homes, poor slums, diverse sources of income, a lack of regulation, contested land tenure rights, uncoordinated conversion of farmland to housing, pollution, environmental problems, intensified resource exploitation, considerable economic dynamism and a widespread lack of service provision [7]. One conceptualization of peri-urban is that it is an area outside existing urban agglomeration where major changes are taking place over space and time [8]. Picking up on the notion of change and time in peri-urban areas, urban expansion is the critical cause as the need for space for housing development intensifies.

Conceptualization of Solid Waste Management

Solid waste management is defined as the discipline associated with the control of generation, storage, collection, transportation, processing and disposal of solid waste, in a way that is governed by the best principals of public health and economic, engineering, aesthetic and other environmental considerations. Solid waste should be properly disposed in order to help protect environmental quality and human health, as well as to preserve natural resources. Solid wastes have both direct and indirect effects on environment and human welfare. Direct effects range from the damage of materials and loss of aesthetic importance to the impairment of human health, thus creating significant socio-economic impacts. Indirect effects are mainly long-term effects which range from change in ecosystem structure and behavior to the climate change, which in turn will affect socio-economy and the sustainability of the region. Solid waste management is strongly influenced by political, legal, social, cultural, environmental, economic factors and available sources. All these issues need to be addressed to reach a sustainable solid waste management action.

Methodology

The paper makes use of data gathered via in-depth interviews with the 50 household heads between March and June 2023. For this study, Emthunzini township was purposively selected among other peri-urban areas of the city of Bulawayo. Primary data was gathered from questionnaire surveys, guided interviews, photograph shooting and direct observation. Secondary data was gathered through desk study of documentary sources such as electronic publications, old newspapers, and library sources. The study used pragmatists ideology where both qualitative and quantitative data was used triangulated with secondary data sources. By using a qualitative structured inter- view approach, the respondents explained and shared their experiences about varying survival strategies they use in managing solid waste. Use of open-ended questions was critical in achieving this as the research required some private and classified information as well as perceptions. Data from questionnaires was quantified and helped to acquire information on the households with dust bins, rubbish pits and those that dump waste in open spaces. SPSS was used to analyze data and produce summary statistics in tables, graphs and charts. Additionally, observations were conducted in order to generate field reports, and photographic evidence was compiled.

Study Site

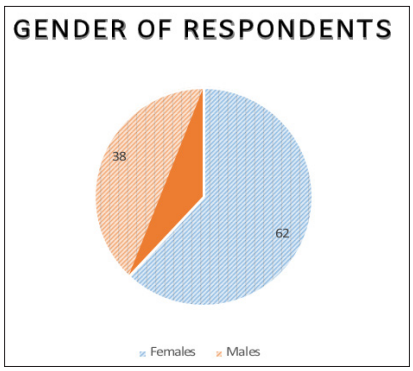
The study was geographically limited to Emthunzini township in the peri-urban area of Bulawayo city of Zimbabwe. It is located in south western fringe of Bulawayo along Solusi road at Umguza rural district council. It is cited along the geographic coordinates latitude -20.167665 and longitude of 28,480035 with an elevation of 1331.93 (Author generated). It has people of diverse languages like Shona, Ndebele, Kalanga, Sotho etc. These people are spreading outside Bulawayo as a result of urban sprawl. Lack of accommodation in the City of Bulawayo has triggered the expansion of built up areas towards Umguza rural district council and it covers a total area of 3214.

Research Findings and Discussions

Gender of Respondents

The majority of the respondents from Emthunzini were females, which is a common feature for peri-urban areas in developing

countries. The heads of households who participated in the study indicated that in terms of sex disaggregation, sixty-two percent (62%) were females while the other thirty-eight percent (38%) represented males (Figure1). Generally, it was noted that more females were interviewed indicating more female headed households. This is a result of the fact that during the time of the study most men had neighboring countries in search of employment. inclusion of the gender dimension in waste management is of necessity because the very definitions of waste and discarded materials may be influenced by the gender of the person making the judgement. For instance, what looks like "dirt to men may be compost or fertilizer to women" [9].



Causes of Poor Waste Management in Per Urban Areas of Bulawayo

The article identifies a series of challenges that residents believe are key impediments to waste management. Urban sprawl is a cause of concern in waste management. This is due to the fact that population is rising at an alarming rate in urban areas forcing outwards expansion of built up areas towards peri-urban areas of Bulawayo. The research gathered from the respondents identified increasing population which leads to high levels of waste generation. Waste management has become a major challenge in peri-urban areas of Bulawayo like in any other urban towns in Zimbabwe due to burgeoning population. This is in line with the observation made by who posits that the rapid pace at which urbanization has taken place over the last years has placed tremendous strain on local authorities' resources, inevitably resulting in failure to provide adequate services in areas under their jurisdiction [2]. The peri -urban areas like Emthunzini are expanding without proper planning hence exposing people to health hazards. This article has indicated due to poor planning at Emthunzini, sewage tanks have been sited around the houses for residents where they are taking an advantage by dumping solid waste inside as shown in Figure 2 below.

Figure 2: Sewage Waste Filled with Solid Waste at Emthunzi Sewage Works

Solid waste is dumped all over the streets and open spaces due to urban to peri-urban conflicts. The research findings indicate that there are squabbles and conflicting interests between Bulawayo city council and Umguza rural district council. This is due to the fact that the Bulawayo city council needs land to accommodate expansion yet the district is worried about loss of revenue base if Umguza plots are taken away. Conflicts of this nature results in failure of both parties to take responsibility of service provision. Hawk flight construction company is struggling to give people services such as water and roads. The responsibility of solid waste management is left hanging and it is not clear on who is to provide such a service. The interviews carried out revealed that the local communities are dumping solid waste around streets and in open spaces around Emthunzini township as a result of lack of refuse collection as depicted in Figure 3 below. There is lack of refuse collection services from both Bulawayo city council and Umguza rural district council. Thus, against this background, there is dire need for the local authorities and government to embark on servicing of residential lands before people-built houses. Emthunzini is one of the peri-urban areas that lack proper services for the benefit of its residents.

Figure 3: Disposed Solid Waste at Emthunzini

Research findings has revealed that poor solid waste management is caused by poor enforcement of environmental laws. The laws exist but there is lack of enforcement which is a stumbling block to proper solid waste management. Formal authorities tend to 'let sleeping dogs lie' hence show ambivalence as they observe the informal dwellers fend to house themselves. It can be argued that in most urban areas like Bulawayo, urban sprawl has not received much attention given the 'abundance' of green fields surrounding the core urban centers. The residents fail to adhere to environmental laws hence dumping solid waste materials all over the streets. Emthunzini township is heavily polluted with decomposing garbage and solid waste as a result of lack of environmental law enforcement.

Furthermore, lack of environmental awareness campaigns at Emthunzini township a cause of poor sewage waste disposal. EMthunzini suburb is dominated by of tenants who are mostly coming from rural areas with low education background. There are unaware of the environmental impacts and health risks associated with illegal dumping of waste in undesignated areas. Respondents identified the lack of resident's awareness on waste segregation, reducing, reuse and recycling. For example, they show that residents do not separate the different kinds of waste before disposal. It is common that their waste is mixed, which is making re-use and recycling a challenge.

Another cause of poor solid waste disposal is unavailability of refuse collection bins. Data gathered from the respondents has indicated that unavailability of refuse bins from the service providers is a cause of poor disposal of solid waste. Seventy-five percent of respondents indicated that they do not have waste bins where they can dispose their waste, which is the sole responsibility of the service providers in authority to ensure that each household has either a metal or plastic bin. Similarly, reveal that 50% of residents in Glenview 8 in Harare indicated that Council did not provide bins, as such they used bin liners which are black plastic papers [10]. This has a negative impact on solid waste management as it forces residents to dump solid waste in undesignated areas.

Methods of Disposing Waste at Emthunzini Township

The common type of waste that is mostly found on the streets of Emthunzini are plastic bottles, plastics, medical waste, condoms and disposable diapers. The research findings indicate that there are various methods used by communities to dispose waste which include, burning, burying, composting, recycling or reusing and illegal dumping of waste in undesignated areas. Illegal dumping of solid waste has a negative impact which has led to creation excessive illegal dumps in the streets, drainage systems and such other sensitive areas. Out of 50 households that were surveyed 15% of households heads argued that they use composting method, 25% said that they resort to burning, 30% are dumping on illegal dumping sites, 25% are burying waste materials and only 5 using recycling and reusing methods. This information is depicted in Figure 4 below;

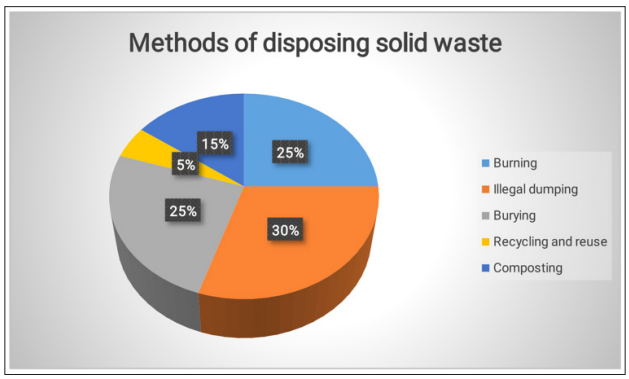


Figure 4: Methods of Solid Waste Management at Emthunzini Township

A greater proportion (30%) of respondents revealed that they relied on illegal dumping as a method of household waste disposal, especially in undesignated places such as pathways, open land, water bodies and storm drains. A small proportion (5%) is practicing sustainable ways of solid waste management like recycling and reuse. This is a cause of concern which means a radical approach is needed to concertize people of Emthunzini on proper solid waste management.

The data gathered from the respondents indicate that 25% of households resort to burning of solid waste as a method of managing waste. This is positive in the lenses of solid waste management however; it has a severe environmental impact as it triggers air pollution. The aerosols released in burning of waste are the major cause of ozone depletion. The dust particles also displace raindrops in the atmosphere resulting in reduced rains which an effect of climate change. It was also noted that the residents burn such household waste on illegal dumpsites without observing the compulsory environmental sanitation.

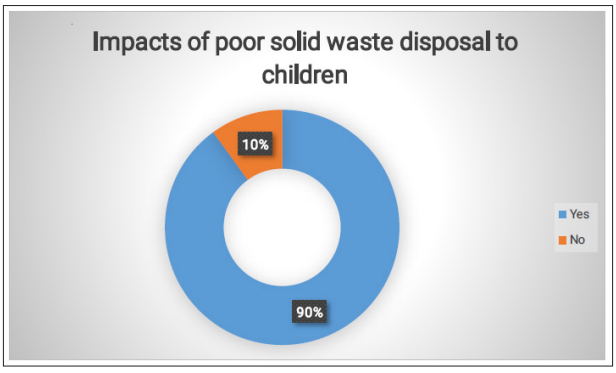
15% of respondents indicated that they are managing their solid waste by composting. This is a critical measure that needs to be adopted by the majority of households. It plays an integral part under the integrated solid waste management strategy that could be implemented in Emthunzini to reduce challenges of solid waste management.

Impacts of Poor Solid Waste Disposal

The solid waste disposal pose dangers to the environment which are potentially harmful to human health and increase the health risk of the residents. The specific health problems established are that dumped wastes have become prime breeding ground for houseflies, rodents, anopheles' mosquitoes and other vectors which in turn spread communicable diseases such diarrhoea, cholera and malaria, among other diseases. Thus, Emthunzini residents appear to be sitting on a ticking time bomb which might explode. As noted by, mosquitoes and houseflies can fly up for 5 kilometers, spreading disease pathogens which make residents situated near these dump sites be susceptible to different diseases [11].

More so, some respondents revealed that they are burning of solid waste. This severely causes respiratory infections such as coughing as this result in the release of fumes such as carbon monoxide and carbon dioxide that are harmful to health. Therefore, there is need to evaluate the impacts of such methods of disposing waste on the local residents for example burning causes odor that make residential areas uninhabitable.

The other impact of poor solid waste disposal affects mostly children who usually play in dumpsites. Data collected indicate that almost 90% of respondents agree to the fact that children play in illegal dump sites searching for toys; as a result, they are susceptible to injuries, cuts and pathogens that cause and spread diseases such as tetanus as shown in figure 5.



Recommendations and Conclusion

This paper has highlighted the challenges of waste management in peri-urban areas of Bulawayo with specific reference to Emthunzini township. It has concluded that, solid waste management is a critical issue that need to be treated with urgency. Peri-urban areas of Bulawayo are immersed with challenges of solid waste management. There are a number of recommendations were revealed from the data gathered from the research. The respondents indicated that they use sustainable ways of managing waste such as recycling, reuse and composting. These methods of managing waste are environmentally friendly and can go a long way towards achieving sustainable development goals. There is need to concertize the whole community of Emthunzini to employ such methods of managing waste to reduce challenges of solid waste disposal.

Research findings indicate that conflicts that exist between Bulawayo city council and Umguza rural district council require a dialogue by the relevant stakeholders to discuss and agree on the compromises to be incurred. note that such conflicts, however, are complex entities and as such, a common approach for better understanding complex entities is to categorize them into a limited number of types.

There is a need to design proper areas or landfill for dumping of solid waste. Data gathered from the respondents indicate that local authorities should earmark certain areas as temporary dump sites in Emthunzini in order to serve as legal sites for solid waste collection. Such areas could be properly managed to reduce hazards associated with poor solid waste disposal This could go a long way in reducing the problems of littering everywhere, illegal dumping of solid waste and the costs of door to door refuse collection.

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