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The Implications of Waste Management on Sustainable Development in Rujeko B Suburb, Masvingo City, Zimbabwe

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ABSTRACT

This study explored the implications of waste management on sustainable development in Rujeko B suburbs. It found that poor waste management practices lead to environmental degradation, health risks, and negative economic implications. Improving waste management practices is therefore essential for the sustainable development of Rujeko B. Poor waste management leads to the accumulation of solid and liquid waste, which can contaminate water sources, pollute the air, and create breeding grounds for disease-carrying pests. This can lead to health risks for the local population, such as respiratory problems, as well as economic losses due to reduced tourism and agricultural production. Furthermore, it can also lead to a decrease in property values, as well as an increase in the costs of waste management. The long-term effects of poor waste management can be devastating, with potentially irreversible damage to the environment and the health of local communities. Improving waste management practices is therefore essential for the sustainable development of Rujeko B. This includes increasing awareness and education campaigns on proper waste disposal and recycling, encouraging waste minimization and reuse, and providing adequate waste disposal infrastructure and services. Additionally, governments should provide incentives to encourage private sector involvement in waste management initiatives. Furthermore, incentives should also be given to individuals and households for reducing their waste production and for participating in waste management initiatives. Finally, governments should implement measures to reduce the environmental and health impacts of poor waste management practices.

Keywords: Waste Management, Sustainable Development, Rujeko B, Masvingo, Zimbabwe

INTRODUCTION

Waste management were recognized at the United Nations General Assembly of 2010 as critical human rights that are important in the full enjoyment of life and all human rights (UNICEF, 2016). Waste management within the global political agenda is embedded in the development of Sustainable Development Goal (SDG) 11, *Ensure sustainable waste services, waste collection and management are essential public services for every community and are necessary for the protection of public health and the environment* (United Nations, 2018). This SDG is a continuation from its predecessor, the Millennium Development Goal (MDG) 7, target 10 which aimed to have the proportion of world population with access of waste collection , clean water supply and sanitation between 1990 and 2015 (United Nations, 2006). This target was however unattainable as per the set timeframe. United Nations Conference on the Environment Development concluded that solid waste management production should be minimized, reuse and recycling maximized and treatment and waste management coverage

(Graham, 2011). Graham (2011) points out that the international community, through the MDGs, recognised the need for emphasis to be placed on 'buy-in' by communities before the implementation of a waste management project, which would also ensure sustainability. The World Conference also recognised the need for adequate inclusion of beneficiaries' preferences into waste management projects' design and implementation (Graham, 2011).

Moreso, at one of its summit in 2000 (Uwaegbulam, 2004), revealed that the World Health Organization (WHO 2004) and United Nations International Children Education Fund (UNICEF, 2004) 2.4 billion people will likely face the risk of needless disease and death by the target of 2015 because of poor waste management like blast of sewage pipes, poor refusal collection and bad sanitation. Bad sanitation includes decaying or non-existent sewage system and toilets fuels the spread of diseases like cholera, typhoid and basic illness like diarrhoea, which kills a child every. The hardest hit by bad sanitation is urban poor and residents of slum areas in fast-growing cities, mostly in Africa and Asia (Napoleon et al., 2011). As a result of this poor waste management changes living standards of people in Asia and Africa.

Waterborne and vector-borne diseases have developed from the impact of waste management on sustainable development. Cholera is one of the most common water-borne infections, with significant fatality rates worldwide as a result of improper waste disposal. According to WHO (2013), referenced in Taylor et al. (2015), there are between 3-5 million cholera cases and 100,000-120,000 deaths per year, only a fraction of which are officially reported. Furthermore, 129,064 cases and 2,102 deaths were reported worldwide in 2013, with 44% of cases reported in Africa and 45% in Haiti alone, where as of December 2013, 696,794 cases and 8,531 deaths have been documented since the outbreak began (WHO 2013, quoted in Taylor et al., 2015). According to Roche et al. (2017), a lack of cleanliness, waste collection, and poor disposal site facilities may contribute considerably to the comparatively high diarrhoeal illness burden in Sub-Saharan Africa (SSA). According to Cairnbridge et al. (2010), 85% of the burden of disease preventable by poor waste management in Africa is caused by feco-oral, primarily diarrhoeal infections, owing to the significant child mortality they cause. This demonstrates how poor waste management, a lack of landfills, recycling sites, and Eco-industrial parks contribute to Africa's high mortality rates.

Waste management has a negative impact on community development in Nigeria, as poor waste management (Nabegu, 2010; Swapan, 2008) states that waste is dumped into drainages, which blocks the free flow of runoff water, causing flooding and harming communities. Some people dump their waste on the roadside, reducing the width of the road and polluting the environment. According to Mazhindu et al. (2012), the spread of communicable diseases such as cholera, typhoid, and amoebic infections in Addis Abeba, Ethiopia was caused by poor waste management. According to Loredana and Maria (2010), various studies have found that a wide range of harmful compounds, such as methane, carbon dioxide, benzene, and cadmium, can be discharged into the environment from garbage disposal sites. These hazardous compounds have a severe impact on humans and cause a variety of ailments such as lung, brain, bladder, and lung cancer (Loredana & Maria, 2010). As a result, the impact of waste management on sustainable development has resulted in improper garbage disposal; sewage discharge causes cancer and congenital deformities.

Zimbabwe has recently been plagued by water-borne diseases such as cholera and typhoid as a result of poor waste management, poor sanitation, poor landfills, a lack of refusal sites, and poor hygiene, all of which are generally attributed to enabling disease transmission at the household level and changing living standards (Hutton & Haller, 2004). As a result, these conditions represent substantial threats that, when combined with vulnerability, quickly escalate into crisis situations. In Zimbabwe in 2008/9, a cholera and typhoid outbreak was caused by a lack of waste management, which included sewage waste and bursting sewerage pipes, among other things (Jonga & Chirisa, 2009). The high figures essentially illustrate how

inattentive to inadequate waste management affects community vulnerabilities, which culminated in Zimbabwe's acute cholera pandemic. These settings created an ideal breeding ground for a variety of WASH-related dangers, which could only lead to disasters. According to the Office for the Coordination of Humanitarian Affairs (OCHA, 2009), as cited in Hove and Tirimboi (2011), a cholera epidemic gripped many parts of Zimbabwe between 15 August 2008 and 17 March 2009, with 191, 164 reported cases and 4, 047 reported deaths.

At the local level, Nhapi (2009) emphasizes the importance of community participation in sustainable community development on waste management provision to enable disaster reduction, identifying urban waste management as a specialized field that requires a lot of technical input as well as stakeholder involvement, as provided for in the formulation of council budgets outlined in the Urban Councils Act (Chapter 29:15). Zimbabwe has developed a number of legal instruments, including the Constitution of 2013, the Environmental Management Act (Chapter 20:27), and the Civil Protection Act (Chapter 10:06), among others, that directly or indirectly state the importance of local level participation in disaster risk reduction. This study focuses on urban communities since, according to Hove and Tirimboi (2011), urban areas face major inefficiencies of waste management due to limited alternatives. Urban communities therefore have a significant role in waste management on community development within their environments with a bid to lower disaster risk and vulnerability to the associated disasters.

MATERIALS AND METHODS

Study Area

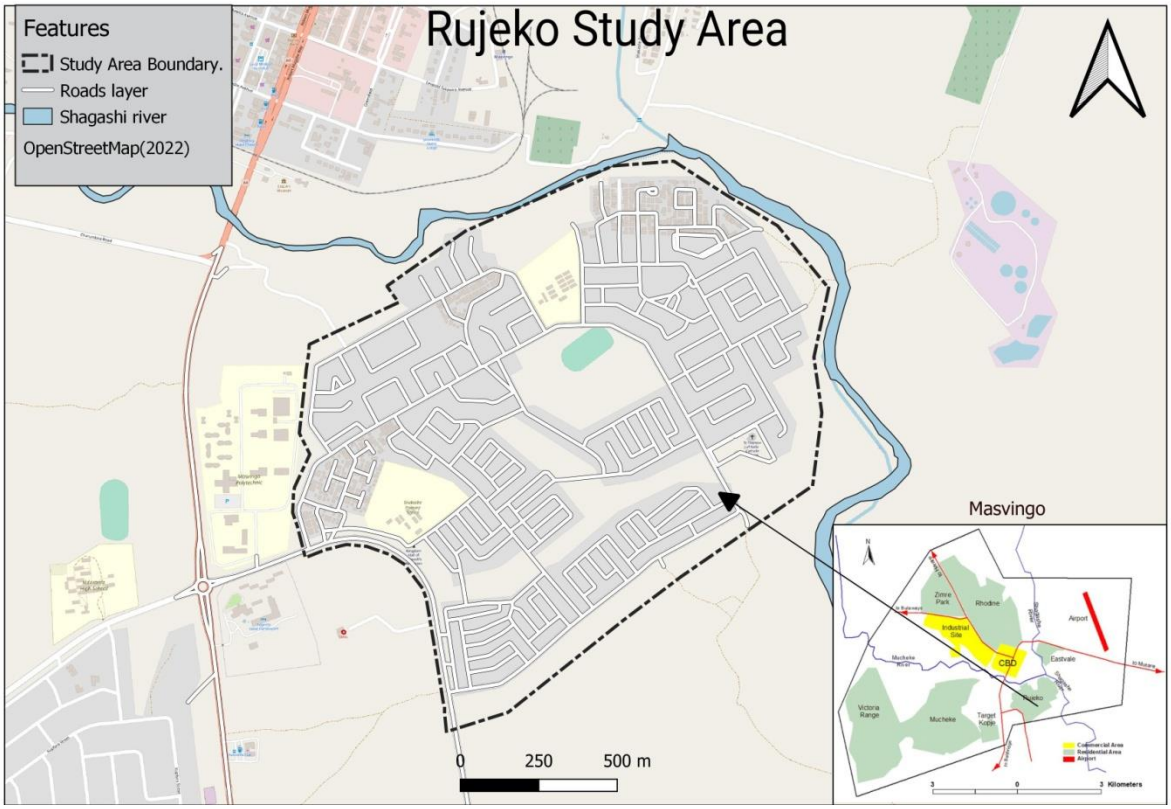

Figure 1: Rujeko Study Area

Data Collection Instruments

Data collection instruments included semi-structured interviews with key informants, survey questionnaires targeted at the elderly and FGDs with the very old among the elderly population (those that could not write). The data collection instruments are detailed below.

Survey Questionnaires

A questionnaire is a research instrument consisting of a series of questions (or other types of prompts) for purpose of gathering information from respondents (Creswell, 2013). Household questionnaire were targeted at the community members in households. These were both closed and open ended questions administered to the elderly who could read and write. The questionnaire was administered to a total of 6 households where the community members had been affected by waste management.60 other households were those with the community members who had knowledge of traditional practises when it came to impacts of waste management on sustainable development in Rujeko B. Their historical experiences were key in unpacking issues of perceptions and attitudes towards the waste management. Local language was key in ensuring participants had a full understanding of the questions asked, therefore, the questionnaire was translated into local Shona language.

Interview Guide for Key Informants

An interview is a conversation for gathering information (McNamara, 1999). The interview guide was used with key informants to compliment information provided by the questionnaire. The advantage of an interview guide is that it allows for follow-up questions to ensure more in-depth information is gathered from participants. Six interviews were conducted with key informants that included the District Development Coordinator, District Health Representatives, and District Medical Officer, Health Officers, and Ward Councillors, senior health experts from health centres and traditional leaders in the target wards in Rujeko B.

Focus Group Discussion

FGDs were held with groups of people from Masvingo City's one ward. FGDs are significant for this study because they allow participants to express their opinions on the effects of waste management on sustainable development and give vital information that one respondent may easily forget or miss. Focus group discussions were arranged one week in advance, and the people who participated were chosen by Rujeko B's headmen and councillors. Purposive sampling was used to choose these individuals, and the ward was partitioned. The researcher conducted three focus group discussions (FGDs) in Rujeko B ward (a total of 12), with each FGD composed by five members of the community. The main grounds for selecting a small number of people are COVID-19 limits and controls.

FGDs were conducted with groups of participants from the community. A focus group aims to "obtain in-depth information on concepts, perceptions, and ideas of a group" (Neuman, 1999: 146). The major goal of an FGD: "… is to let people spark off one another, suggesting dimensions and nuances of the original problem that any one might not have thought of. Sometimes a totally different understanding of a problem emerges from the group discussion" (Rubin and Rubin, cited in Marvasti, 2004: 24). FGDs are therefore significant in this study because they allow participants to voice their ideas in a multi-vocal manner, and they have the added benefit of participants reminding each other of vital information that one respondent may easily forget or neglect. Due to COVID-19 constraints, these FGDs were scheduled two weeks in advance, and the coordination of participants was supported by the Environmental Health Technicians (EHT) of each location. Each FDG received a total of 60 minutes.

DATA ANALYSIS, PRESENTATION, INTEPRETATION AND DISCUSSION

Introduction

The chapter focuses on analysing the study results. Findings are presented and interpreted using a thematic approach. Themes were drawn from research questions and objectives. As well as the theoretical models underpinning this study.

Research Findings and Discussions

Presented in the sub-sequent subheadings are results obtained through survey questionnaires, Key Informant Interviews (KII), literature review, observations and Focus Group Discussions (FGDs).

Respondent's Response Rate

The response rate from the four wards is summarised in Table 1.

Table 1: Participants' response rate

Description of instrument	Type of Participants	Original Sample	Actual Participants	Percentage response rate
Unstructured questionnaire	Community members	60	30	50%
Key informant interview guide	District Health Representatives	4	4	100%
Focus Group Discussion	Councillors and other community members	48	48	100%
Total		112	82	83%

Source: Author generated

The response rate was 83%, sufficient to generate the expected data and results that can be generalized over the original sample of 112. As indicated in Table 1, 50% of the community members in Rujeko B communities participated in the study, again sufficient to provide reliable and dependable data and information. 50% is a highly representative figure. According to the FGDs, the 50% that participated in the study, were either impacted by waste management on sustainable development. Those who failed to participate, reasons were given as either not available or were not willing to participate in the study. All Key Informants from Ministry of Health and EHT availed themselves for the study. These provided valuable expert information needed for the study. 48 (100%) councillors and other community members.

Respondents' Gender

Fifty-six percent (56%) of the respondents were female, while the other forty-four percent (44%) were males as shown in Figure 2. Generally, it was noted that more females participated in the study and the numbers are reflective of the gender patterns in the country, where there are more females than males. The implications of waste management on sustainable development also affects women, children and disabled people in terms of water borne diseases. Nursing and care for the sick in the home is general a women's and disabled persons domain as explained by participants to the study.

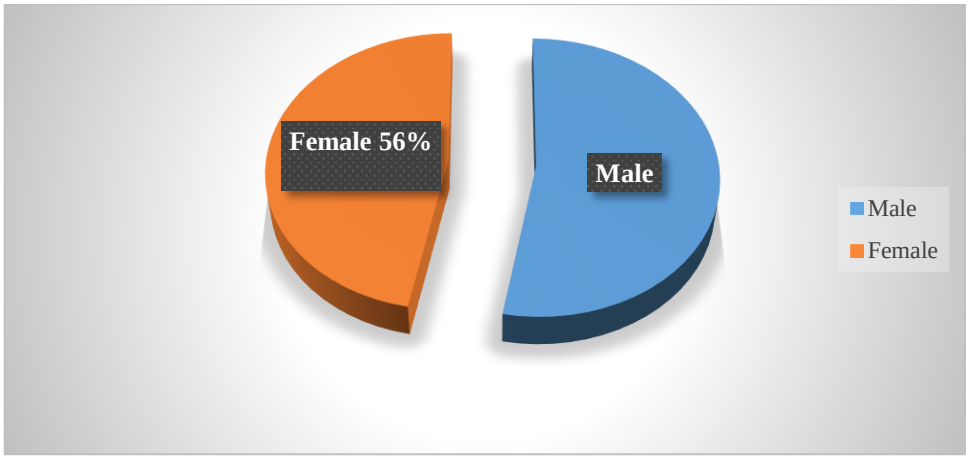

Figure 2: Gender of respondents
Source: Author generated

In any disaster risk reduction activities in Rujeko B, females and children tend to have more time for information dissemination and working with EHT to ensure males and children are protected and safe. Men tend to spend too much time socialising, if not at work. Such percentages could also imply that women spend time away from home whilst participating in waste management and are mostly affected by poor health and living standards changed radically as compared to their male counterparts. This could explain why they were few male respondents. It could also mean that the majority of people participated in the impact of waste management on sustainable development to residents in Rujeko B.

Age of Respondents

Results showed that fifty percent (50%) of the respondents were aged between 50 and 55 years, twenty percent (20%) were between 56 and 60, fifteen percent (15%) between 61-65 years, and ten percent (10%) aged between 66-69 years. The oldest represented age group of 70+ years constituted the remaining five percent (5%) (Figure 3).

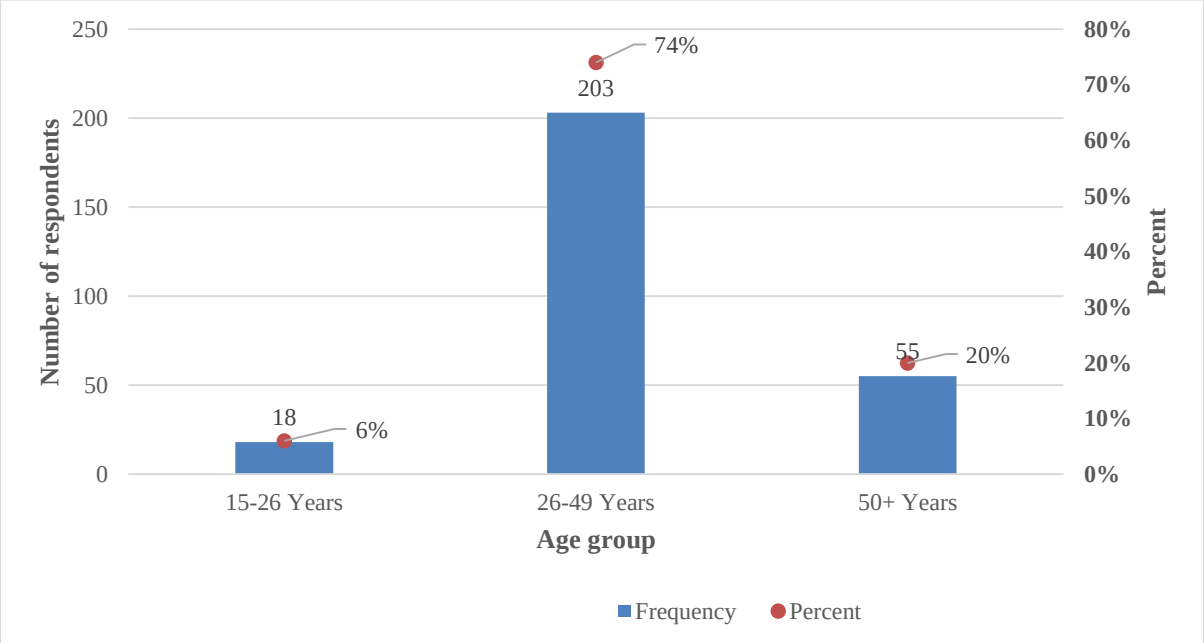

Figure 3: Age of participants

Data collected on the age of Rujeko B residents who participated and affected by implications of waste management on sustainable development in the study showed that seventy three percent (73%) of the respondents were aged between 26 and 49, twenty percent (20%) were aged between 50 and 69 and the least represented age group of between 15 and 25 constituted the remaining seven percent (7%). The most active age group was 50 and 55 years and these were in the majority (50%) and vulnerable to the implications of waste management on sustainable development to residents in the Rujeko B. 30% were considered the most vulnerable to the waste management issues and health problems given their advanced age (61-70+years).

Marital Status of Respondents

The data collected on marital status indicated that sixty percent (60%) were married, ten percent (10%) w separated, fifteen percent (15%) widowed, ten percent (10%) were single and five percent (5%) divorced as shown in Table 2.

Table 2: Marital Status of Respondents

Marital Status	Number of Respondents	Percent (%)
Married	36	60%
Separated	6	10%
Widowed	9	15%
Single	6	10%
Divorced	3	5%
Total	60	100

Educational Background of Respondents

In terms of the educational status of Rujeko B residents who participated in the study, it was noted that seventy three (73%) percent of respondents attained primary level, twenty percent (20%) attained secondary education and the remaining seven percent (7%) managed to attain tertiary education. In essence, this implies that the majority of Rujeko B residents are illiterate and thus this enables them to be affected by poor waste management and failed to take part in the waste management issues that prompted them to be affected by water borne diseases as well as embrace the concept of community participation and Pressure and Release model thus resulting in progression vulnerability context is being showed. Figure 4 below provides a clear representation of these statistics.

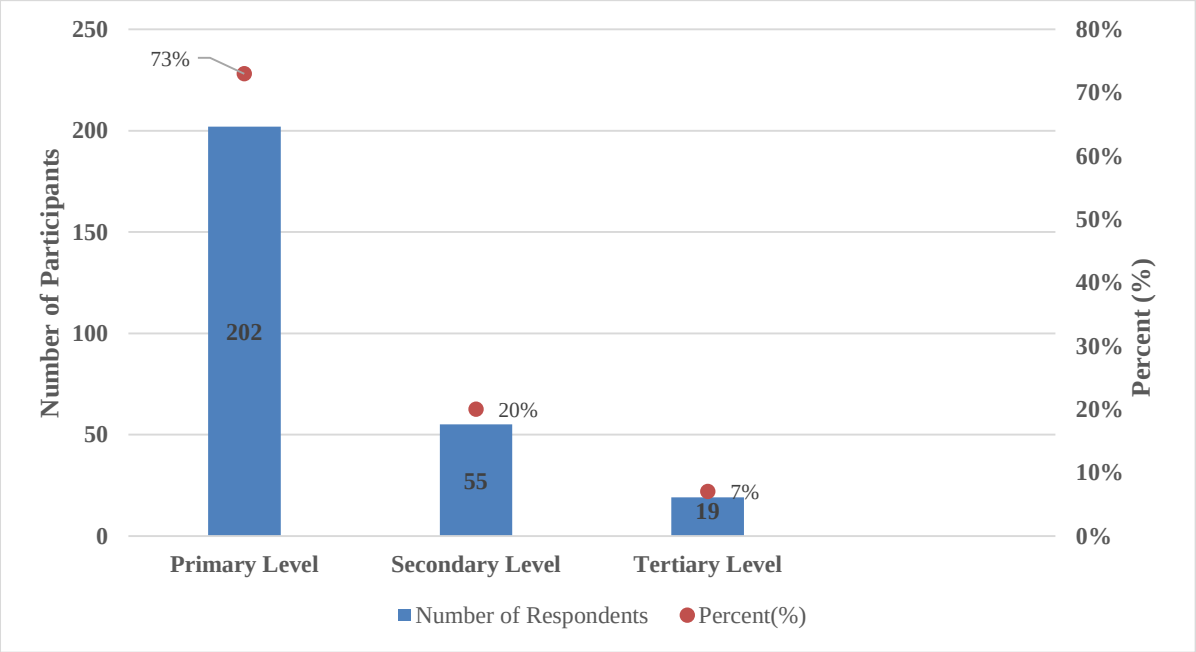

Figure 4: Respondents' level of education
Source: Author generated

Extent of Residents Affected by Implications of Poor Waste Management in Rujeko B

Residents of Rujeko B affected by poor waste management

From unstructured questionnaires shows that seventy three percent (73%) of the study participants highlighted that they were affected by poor solid waste management. The other twenty seven percent (27%) revealed that they were not impacted by poor waste management. Reasons cited for non-affected included more efforts being put towards waste management, awareness campaigns of solid waste management and educating local communities. These activities therefore left no time for participation in waste management. Furthermore, Bazarragchaa (2011) notes that CBDRM is important as it addresses the top-down approaches to development planning which usually fail to address local needs, ignore the potential of local resources and capacities and which may generally increase people's vulnerabilities to disasters. There could also be a relationship between respondent level of education and their level of participation. This strong affected their health and living standards, One would note that the vulnerability increased as external; and internal pressures arise. Pressure and Release model assumes that causes of vulnerability and how they can be discerned from risky conditions and ties them with socio-economic pressures to key root causes (Wisner, 2003:43).

Interviews with key informants (Health Representatives) (HR) revealed that residents of Rujeko B are being affected by waste management of solid waste refusals. This correlates with responses from FGDs that echoed similar sentiments. The household's owners and tents in Rujeko B in FGDs acknowledged that most of the people were affected in the solid waste management as a way to improve good health and living standards. Some indicated that it community participation is the mother to success in terms of community development. Given the high levels of education among residents of Rujeko B, it shows they paid heed to government's messages on the community participation in the waste management and knew what to do to reduce the spread of cholera and typhoid. One respondents quoted from FGDs had this to say:

"As residents of Rujeko B, we being affected by solid waste due to lack of waste management as a way to improve health and living standards".

As a result, the bottom up approach to project communication is indicative of interactive participation that is espoused in Pretty's (1995) typology of participation. This interactive participation shows that the Rujeko B community is progressing from what pretty (1995) terms as bad forms of participation to those that are seen as learning processes that prove to be most desirable towards self-mobilisation that aids in autonomy. One would not that the community faced a lot of health problems due to lack of community participation in waste management , this is described by Pressure and Release model assumes that causes of vulnerability and how they can be discerned from risky conditions and ties them with socio-economic pressures to key root causes (Wiesner, 2003: 43).

Extent in which residents knowledge on waste management strategies achieved at household level

One key informant, Health Representative (HR) from Mazorodze clinic in Rujeko B indicated that residents in Rujeko B managed to reduce cholera, typhoid and COVID-19 pandemic as a result of awareness campaigns and educating each households in Rujeko area. One of the key informant from council authorities noted that residents are being formulating environmental health watchdogs .These environmental health watchdogs act as police that are ment to enforce and to arrest members of public who throw litters and other garbage's. The Release model assumes that causes of vulnerability and how they can be discerned from risky conditions and ties them with socio-economic pressures to key root causes (Wiesner, 2003:43). One respondents quoted from FGDs had this to say:

> *"As residents of Rujeko B we are survived using* environmental health watchdogs and disaster risk reduction models to mitigate *cholera, typhoid and diarrhoea".*

Barriers hindering the Rujeko B residents from achieving waste management

One key informant, Health Representative (HR) from Rujeko clinic in Rujeko A indicated that barriers to on waste management community in order to achieve good health and living standards stemmed from economic hardships choking community members' ability to contribute financially to project development and upkeep though willingness will be there. She noted that community members may fail to raise money required for requirements like opening up dumping sites, buying black bins and transportation of cabbages waste among others.

Some respondents also raised the issues of lack of economic incentives for community members and city council workers in time. The country is characterized by gross economic hardships that require people to work hard so as to earn a living. As a result, residents and city council health workers lacks the economic incentives in time that people require in order to better their quality of living, leading to more focus being placed on economic activities rather than voluntary community projects. Other respondents felt that the search for economically gainful opportunities so as to earn a living presents as a barrier to maximum good health and living standards in waste management disaster risk reduction in Rujeko B.

Some respondents from FGDs noted that residents of Rujeko B were frustrated with basic service provision as well as failed past initiatives presented as barriers on good health and living standards. Key informants felt that external agencies like Environmental Management Agency (EMA) plus MCC do not walk the talk and therefore identified waste management needs are never met which leads to more frustration on the part of the community members good health and living standards. The Pressure and Release model (PAR) posits that unsafe conditions immediate manifestations of vulnerability , dynamic pressures from EMA and MCC underlying causes and this resulted into people vulnerable to poor health facilities and living standards reduced (Wisner, 2003).

Policy and Legal Frameworks Guiding Waste Management

Findings from unstructured show that residents in Rujeko B were guided by policies legislations guided solid waste management. Other respondents from interviews shows that

low figure of legislation awareness is reflective of inadequate attention being placed on awareness raising pertaining legislation by policy makers. From the FGDs one respondents highlighted that laws and policies are made for the people but if the very target of such legislation is unaware of it, problems arise as there could be abuses by implementers who may choose to take advantage of this lack of knowledge on the part of the communities. Service delivery ends up being done haphazardly as beneficiaries are unaware of what they have adopted what might be considered as effective response mechanisms in fighting the pandemic. Pressure and Release model assumes that causes of vulnerability and how they can be discerned from risky conditions and ties them with socio-economic pressures to key root causes (Wiesner, 2003: 43). As a result of ignorance of city council authorities, residents suffers from Cholera and Typhoid. One respondents quoted from FGDs had this to say:

> *"President of Zimbabwe, Dr E.D Mnangagwa encouraged people to follow environmental laws in order to manage solid waste refusals".*

Effectiveness of Legal Framework in Promoting Good Health and Living Standards

One of the respondents from unstructured questionnaires posits that legal framework were working very well in promoting good health and improving standards of living. One of key informants highlighted that residents of Rujeko B were afraid of disposing solid waste at the opening place as there were afraid to be persecution and pay fines .This promoted good health and living standards of residents of Rujeko B changed dramatically. Waste Management are both in the interest of public health as provided for in the Public Health Act (Chapter 15:09) which was then repealed and replaced by the Public Health Act (Chapter 15:17). Provisions of good waste management are clearly outlined in sections 86-90 of this Act with section 86 stating the local authorities' duty of furnishing better waste management supplies (provision and maintenance) for dumping fills, recycling zones and eco-industrial parks to the best of their abilities. Local authorities are also given responsibility for constructing, equipping and maintaining any works deemed necessary for collecting, pumping of waste and construction of land fill sites. As a result, the bottom up approach to project communication is indicative of interactive participation that is espoused in Pretty's (1995) typology of participation.

CONCLUSIONS

Several conclusions were generated from research findings presented in this study and are as follows:

- One major conclusion was that owing to recurrent diarrhoeal disease outbreaks occurring in Rujeko B suburb, the community is moving from a passive state to a more active one in terms of waste management as reflected by a greater percentage of study.
- There is more realisation by communities that they are the sole beneficiary of better waste management provision and this ignites their willingness to participate in and contribute to community activities aimed at reducing poor waste management related disasters.
- The study also concluded that communities are grossly dependant on external agencies for initiation of poor waste management disaster risk reduction projects as well as participation in these. On its own, the Rujeko B community has failed to initiate and sustain good health and living standards, with funding being a major issue for it.
- Barriers to achieve good health and living standards in waste management disaster risk reduction are mainly hinged on inadequate knowledge and information provided on the way in which projects will be implemented as well as information on potential benefits to be realised from participation. Information sharing is an important link to better community participation and therefore if compromised, participation is done half-heartedly.

- Other barriers to community not achieving good health and living standards in poor waste management in Rujeko B included donor dependency syndrome, poverty, lack of economic incentives for community participation, frustration with basic service provision as well as failed past waste management initiatives. Some respondents felt that the Rujeko B community is side lined in project implementation as external agencies bring in expertise from outside the Rujeko B community without empowering and including community members in the project cycle. These residents felt that they do not have a say in how projects are implemented and so their participation in the projects is limited to none.
- Another conclusion was that on a national level, Zimbabwe has good legislation guiding the provision of waste management services but however, communities lack awareness of these so as to demand accountability from service providers. The service providers themselves in the form of external agencies also have limited knowledge of the legislation that guides their programming.
- In the same vein, it was concluded that good policies that guide the implementation of community participation in disaster risk reduction in Zimbabwe are in existence; however their implementation is not evident. The policies and legal frameworks include the Civil Protection Act, the Public Health Act, and the Waste Management Act to mention but a few. These exist on paper but their provisions are unknown or partially known thus leading to poor implementation.

RECOMMENDATIONS

Recommendations that suggest solutions for increasing community participation in waste management disaster risk reduction have been offered stemming from through discussion of research findings and resultant conclusions. These recommendations will enable key stakeholders in waste management provision as well as overarching disaster management to come up with sustainable solutions to improving service delivery, improve community participation and finally, come up with long-term answers to mitigate poor waste management related disasters in Zimbabwe's urban areas.

- In terms of increasing community resilient participation in waste management disaster risk reduction projects, external agencies should comprehensively involve communities in all stages of the project life cycle. Information sharing between external agencies and the community should also be thorough so as to ensure that both parties are on the same level pertaining waste management project implementation.
- Authorities involved in waste management provision such as the MCC, NGOs and funding agencies should empower communities to start their own community projects without dependence on funding from such external agencies. Communities should be supported in project development and ownership to avoid resultant donor-dependency. This will equip them with the autonomy needed in self-mobilisation which is seen as the ultimate indicator of community participation by Pretty (1995). Having the ability to self-mobilise will move communities from not having power having power in terms of initiating waste management provision projects.
- There is need for local resource mobilization to be explored so as to reduce dependency on the external support agencies. Both community participation and local resource mobilization will be vital for sustainability of the waste management disaster risk reduction projects.
- More also needs to be done in raising awareness on policy and legislation guiding waste management for both beneficiaries and implementers. Service providers are also equipped with the right knowledge needed for improved service delivery thereby benefitting both parties.

- Legislative modifications are required to guarantee that legislation remains relevant to the current environment. Most legislation in Zimbabwe is antiquated and in need of updating to accommodate changes in the environment to which it was originally applied. Legislation should be updated to reflect societal and technical advances.

FOR FURTHER RESEARCH

The study identified several potential research gaps and opportunities which may be considered and pursued by current and future researchers in the future. One such potential area is a comparative analysis of community development in waste management in urban and rural areas of Zimbabwe.

REFERENCES

Arnstein, S. R. (1969). A Ladder of Citizen Participation. *Journal of the American Planning Association, 35*(4), 216-224.

Babbie, E. (2001). *The Practice of Social Research* (9th ed.). Belmont CA: Wardsworth Thomson.

Bazarragchaa, S. (2011). *Community Participation in Disaster Risk Mitigation: A Comparative Study of Mongolia and Japan*. Final Report: Mongolia.

Betera, L. (2011). *Overview of Disaster Risk Management and Vulnerability*. Civil Protection Unit.

Cairncross, S., Hunt, C., Boisson, S., Bostoen, K., Curtis, V., Fung, I.C.H., & Schmidt, W. (2010). Water, sanitation and hygiene for the prevention of diarrhoea. *International Journal of Epidemiology*, *39*(1), i193–i205. https://doi.org/10.1093/ije/dyq035

Carter, K. A., & Beaulieu, L. J. (1992). *Conducting a Community Needs Assessment; Primary Data Collection Techniques*. Gainesville, FL University of Florida- Institute of Food and Agriculture.

Cornwall, A. (2008). Unpacking 'Participation': models, meanings and practices. *Community Development Journal*, *43*(3), 269-283.

Creswell, J. W. (2013). *Qualitative inquiry & research design: Choosing among five approaches* (4th ed.). Thousand Oaks, CA: Sage.

Fombad, C. M. (2018). Constitutional entrenchment of decentralization in Africa: An overview of trends and tendencies. *Journal of African Law*, *62*(2), 175-199.

Government of Zimbabwe (1989). Zimbabwe Civil Protection Act: Parliament of Zimbabwe Document (Chapter No.5, pp. 18). Harare.

Government of Zimbabwe (1998). Civil Protection Act (Chapter 10:06). Print-flow, Harare.

Government of Zimbabwe (1998). Zimbabwe National Water Act (Chapter 20:25). Print-flow Harare.

Government of Zimbabwe (2017). The Zimbabwe National Sanitation and Hygiene Policy.

Graham, J. (2011). Tackling the Water Crisis: A Continuing Need to Address Spatial and Social Equity. In J. M. H. Selendy (Ed.), *Water and sanitation-related diseases and the environment* (3-15). Wiley-Blackwell.

Hutton, G. (2012). *Global costs and benefits of drinking-water supply and sanitation interventions to reach the MDG target and universal coverage*. World Health Organization, Geneva.

Hutton, G., & Haller, L. (2004). *Evaluation of the Costs and Benefits of Water and Sanitation Improvements at the Global Level*. World Health Organization, Geneva.

IFRCS (2006). Vulnerability and Capacity Assessment Lessons Learned and Recommendations International Federation of Red Cross and Red Crescent Societies, Geneva.

International Water Agency, IWA (2004). The Bonn Charter for Safe Drinking Water, Bonn.

Koontz, H., & Weihrich, H. (2004). *Essentials of Management*. Tata McGraw-Hill Limited New Delhi.

Kothari, C. R. (2011). *Research methodology: Methods and techniques* (2nd ed.). New Age International, New Delhi.

Manzungu, E. (2004). *Water for all: improving water resource governance in Southern Africa*. Gatekeeper series No. 113.

Mapira, J. (2006). Residential property ownership by Zimbabweans living in the diaspora; the case of Masvingo City (Zimbabwe). *Zimbabwe Journal of Geographical Research, 1.*

Mapira, J. (2007). Pollution of Sakubva River in Mutare (Zimbabwe): Culprits, Penalties and Consequences. *Zimbabwe Journal of Geographic Research, 1.*

Mapira, J.C. & Chinoneka, T.I. (2007). Operation Murambatsvina: The birth and demise of Mucheke Squatter Settlement in Masvingo City (1990-2005). *Zimbabwe Journal of Geographical Research, 1.*

McGranahan, G., & Mulenga, M. (2009). Community Organization and alternative paradigms for improving water and sanitation in deprived settlements. *Water and Sanitation Services: Public Policy and Management, 173.*

Mubita, A., Libita, M., & Mulonda, M. (2017). The Importance and Limitations of Participation in Development Projects and Programmes. *European Scientific Journal, 13*(5).

Muyambo, A., & Klaassen, W. (2015). Capacity Building for Zimbabwean Urban Local Authorities in Water Supply Needs Assessment and Business Opportunities Report, Netherlands Enterprise Agency.

Nhapi I. (2015). Challenges for Water Supply and Sanitation in Developing Countries: Case Studies from Zimbabwe. In Grafton Q., Daniel K., Nauges C., Rinaudo J.D., & Chan N. (Eds.), *Understanding and Managing Urban Water in Transition. Global Issues in Water Policy* (Vol. 15). Springer, Dordrecht.

Nhapi, I. (2009). The water situation in Harare, Zimbabwe: a policy and management problem. *Water Policy*, *11*(2), 221-235.

OCHA (2009). Regional Update No. 7, Cholera or Acute Watery Diarrhoea Outbreaks in Southern Africa. http://idh.cidi.org:8080/disaster/09a/ixl78.html.

Pérard, E. & Mattei, F. (2007). Private Sector Participation and Regulatory Reform in Water Supply: The Middle East and North African (MEDA) Experience. *Journal for Private Sector Participation and Regulatory Reform in Water Supply, 21*, 4-20.

Rottier, E., (2011). *Global Wash Cluster Capacity Building for Humanitarian Response Disaster Risk Reduction and Water, Sanitation and Hygiene*…Comprehensive Guidance, A Guideline For Field Practitioners Planning And Implementing Wash Interventions. New York, UNICEF.

Sandison, P. (2018). *Community Engagement in Sanitation: A landscape review*. Oxfam.

Singh, K. (2007). *Quantitative Social Research Methods*. New Delhi, Sage Publications.

Taylor, D.L., Kahawita, T.M., Cairncross, S., & Ensink, J.H.J., (2015). The Impact of Water, Sanitation and Hygiene Interventions to Control Cholera: A Systematic Review. *PLoS ONE, 10*(8), e0135676. https://doi.org/10.1371/journal.pone.0135676

UNICEF and AusAID. (2009). Assessment of Water and Sanitation facilities in Four Urban towns. Chipinge Assessment report.

UNISDR. (2009). Terminology on Disaster Risk Reduction, Switzerland: United Nations, Geneva.

United Nations (2018). Sustainable Development Goal 6 Synthesis Report 2018 on Water and Sanitation. New York.

United Nations. (2006). United Nations, Water a shared responsibility. The United Nations World Water Development Report 2, New York, UNESCO and Bergharn Books.

Wellington, J., & Innocent, C. (2009). Urban local governance in the crucible: Empirical overtones of central government meddling in local urban councils affairs in Zimbabwe. *Theoretical and Empirical Researches in Urban Management*, *4*(3 (12), 166-182.

Wisner, B. & Adams, J. (2003). *Environmental health in emergencies and disasters: a practical guide*. World Health Organization.

Zubir, S. & Amirrol, H. (2011). Disaster risk reduction through community participation. *WIT Transactions on Ecology and the Environment*, *148*, 195-206. https://doi.org/10.2495/RAV110191