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RESEARCH ARTICLE

EMERGING SOLID WASTE MANAGEMENT ISSUES IN BEITBRIDGE BORDER TOWN: EVIDENCE FROM A PARTICIPATORY APPROACH

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Abstract

Driven by the fears of repeated 2008/2009 cholera incidence that affected Beitbridge Town Council (BTC) amongst other urban centres, this study uses a participatory methodology to gather and synthesise the views of key stakeholders involved in solid waste management (SWM). Within this approach, field observations, scenario analysis and document review were triangulated with stakeholder insights to recommend practical and urgent solution to avert a potential public health disaster. Focus on BTC also stems from its unique experience that can be explained by demographic and socio-economic characteristics of a sizeable transit population, albeit insignificantly contributing to the town's revenue. This situation complicates service provision such as SWM. However, questions have been raised to understand why the town exhibits a sharp contrast from its counterpart, Musina in South Africa, which generally meets the expected sanitation standards. Could it be that the town authorities have totally forgotten about the 2008/2009 cholera disaster? Or, the unravelling situation is beyond the capacity of the town to cope? The study isolated demographic pressure, from a mix of transit migrants and natural population growth, triggered by economic challenges that tend to attract people to the border with South Africa, coupled with weakening capacity of the town council to manage solid waste and other social services. Other drivers of poor SWM are seen in mushrooming of unserviced residential stands, unregulated business activities and absence of functional by-laws. We aver that in order to avert a looming health disaster, there is urgent need to capacitate the town council through a holistic and multi-stakeholder approach that should embrace the concept of integrated solid waste management.

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Introduction:-

The challenges of solid waste management (SWM) in Zimbabwe's urban landscape are not confined to Beitbridge Town Council (BTC) alone. Improper solid waste management has characterised the country's cities, towns and growth points, and in some cases, the problem is extending to highways. A baseline study conducted by the Environmental Management Agency (EMA) has identified the major challenges as littering, dumping and non-separation of waste. Through a waste management lens, it cannot be disputed that rampant littering and filthy scenes characterise the country`s cities, towns, growth points and rural service centres. Evidence that this development poses a serious public and environmental health threat abound (for example, Makoni *et al*., 2004; Parrot *et al*., 2009; Chanza & Chirisa, 2011; Musademba *et al*., 2011; Tsiko & Togarepi, 2012; Makwara & Magudu, 2013; Musingafi *et al*., 2014). However, the uniqueness of Beitbridge's problem has become a particularity owing to numerous drivers that are the focus of this study. Urbanisation associated with rapid expansion of partially developed residential settlements, coupled with worsening incapacities of the local authority to attend to basic services like municipal SWM and portable water supply seem to be the major challenges confronting BBT. In this mix, demographic pressure from natural increase and transit population, added to economic challenges are evidently aggravating the problem of solid waste accumulation. Statistics from the Zimbabwe Statistics Agency indicate that Beitbridge's population doubled to 40,000 during the decade of 2002 to 2012 (ZimStat, 2012). As such, it is one of the fastest growing population centres in Zimbabwe. Owing to its strategic location that forms a major conduit for the movement of population and goods in the southern Africa region, the border town also supports a transit population of 6,000, which usually rises to 12,000 people during peak periods (Immigration Official, *pers. com*). This exert pressure on the limited infrastructure and services. Essentially, it is worth noting that during the 2008/2009 outbreak of a cholera epidemic, Beitbridge suffered the greatest pinch. However, its counterpart, Musina in South Africa exhibits a sharp contrast in urban service provision. Accordingly, the demographic force alone may not be convincing to explain the poor SWM situation in BBT. Against this background, this paper uses a participatory methodology to understand the emerging issues around SWM in the town. In our reasoning, we aver that such an approach may be useful in bringing to the attention of policy makers and service providers, appropriate solutions to address the identified challenges.

The study is driven by the interest to establish the emerging issues that have led to poor SWM in the border town. A conceptual treatment is given by reviewing scientific literature that examines the topic of SWM. This analysis is then followed by a justification of the participatory methodology adopted. The major findings are presented based on a synthesis of various opinions and views raised by stakeholders who participated in public and expert meetings. We then used reflexive pragmatism to advance a possible course of action to address the issues.

Scholarly attention to solid waste Management:-

There has been phenomenal growth in scholarship that treats the topic of municipal solid waste management. However, this does not always translate into adequate understanding about the complex challenges of SWM. This section briefly analyses scientific literature related to the concept of SWM. It looks at how participatory approach could be used to enhance understanding of SWM challenges and to design appropriate solutions for curtailing the problem. This is then followed by describing the geography of the study area in order to understand factors that undergird the problem.

Complexity in coming up with comprehensive attention to the topic stems from the geography of the territory concerned (Mihai, 2012), exponential growth of population and urbanisation, and the advancement in social economy, coupled with improvement in living standards (Karak *et al*., 2011). Global estimates of solid waste generation are reported by Karak *et al* (2012) as exceeding 2 billion tonnes per annum. With the increasing global population, the situation exerts enormous pressure on the majority of local authorities in developing countries. Earlier studies by Tevera (1991), Masocha (2006) and Chanza and Chirisa (2011) warned that local authorities alone are incapable of effectively dealing with solid waste. To Karak *et al* (2011), municipal solid waste entails a collection of waste generated from domestic, commercial and construction activities that should be managed by municipalities. This definition is critical in designing appropriate waste management plans (Rushbrook & Finnecy, 1988).

Scholarly attention to the challenges of SWM in Zimbabwe's urban areas has been remarkable. Masocha's (2004) and (2006) studies did not only look at the spatial dynamics of SWM and the associated ecological and public health threats. In an attempt to break the tradition mostly held by local authorities of regarding waste as a nuisance, he uses Victoria Falls as a case study to show the socio-economic benefits associated with waste harvesting. His interest

centred on the role played by informal waste collectors against a background where authorities fail to cope with rapid urbanisation. Earlier, the discourse on the contribution of informal waste collection to the SWM system was raised by Tevera (1993) and (1994) in Harare and Gaborone, respectively. This reference relates well to the present study where the informalisation of the economy is evident. Given the underperforming economy in Zimbabwe, a large size of the population, both resident and transit, has seen informal trading as a livelihood option. Strategies by the local authorities to attend to the waste management demands in the informal sector have failed to match with the nature of activities found there (Makoni *et al*., 2004; Chanza & Chirisa, 2011; Jerie & Tevera, 2014). In Gweru, for example, Jerie and Tevera (2014) showed that the waste management challenges tend to be worsened by the rapid growth of the informal sector.

Although the Zimbabwean legislation now requires local authorities to construct sanitary landfills for SWM, various capacity gaps remain a challenge. Most established cities and towns such as Harare, Bulawayo, Gweru, Mutare, Chinhoyi and Bindura are still involved in crude dumping on unsanitary dumpsites and Beitbridge is no exception. For example, Musademba *et al* (2011) reveal that Chinhoyi Municipality lacks financial and material resources to tackle solid waste generated. The resultant failure to collect and transport the waste to disposal sites leads to illegal dumping, burning, compositing and/or burying at the source of generation. In Masvingo, Mangizvo (2008) unearthes several regulatory flaws in its waste disposal practices. Similar to the Beitbridge situation described later in this article, there is no characterisation of the wastes brought to the unprotected dumpsite in Mucheke. The various wastes that are heaped there remain uncovered. Jerie and Tevera (2014) also observe unrestricted access to crude dumpsites in Gweru. Burning and open dumping are also cited as waste disposal options by the Gweru local authority.

The environmental health and public health threats, which are the focus of this article, have also been adequately covered by most of the scholars cited here. In a study to assess the impact that poor waste disposal poses in Epworth area in Harare, Makoni *et al* (2004) recorded high incidences of diarrhoeal disease outbreaks. Describing the situation as a health hazard, the authors cited a mix of poor sanitation practices ranging from indiscriminate dumping of household waste, inaccessibility of portable water to appalling toilet facilities. A later study carried out by Chanza and Chirisa (2011), specifically to assess the SWM practices in the area, described the situation as a public health dilemma. They argued that Epworth Local Board authorities faced a challenge of meeting the dual objectives of public health services and environmental quality in a milieu of a poverty where the residents cannot pay for the desired services. In Masvingo, Mangizvo (2008) relates the poor SWM to a looming environmental disaster. Bemoaning the inefficient waste management mechanisms by municipalities in Zimbabwe, Makwara and Magudu (2013) coined the situation as "reckless gambling with people's health and lives." Critical to note in this analysis is that the conditions described in past studies are similar to those of the study area. A closer examination would take us to the health disaster outbreak of 2008/2009. According to Olu *et al* (2011) and WHO (2009) the cholera outbreak that began in August 2008, recorded over 98,000 cases and more than 4,000 deaths by June 2009 when the epidemic was officially declared over.

Clearly, although several studies have been done to assess the SWM practices in various urban localities in Zimbabwe, Beitbridge has not been given a specific scholarly attention. In this study we advance the reasoning of Mubaiwa (2006), Mangizvo (2008), Tukahirwa *et al* (2010), Makwara and Magudu (2013), among other scholars, who call for a community-based model of addressing the SWM challenges. Of late, community participation in the SWM system has received great attention in both policy and practice. This study hypothesises that a participatory approach, from identifying the SWM issues to proffering intervention options, could be very effective in giving directions for sustainable solid waste management.

Description of the Study Area:-

The study was conducted in Beitbridge Town Council located in the Southern part of Zimbabwe, which boarders with South Africa's Musina Town. Figure 1 shows the locational map of BTC. The town which was established in 1929 has approximately 11,959 households with an estimated population of 42,218 and a transit population of approximately 10,000 people (ZimStat, 2012). It is Zimbabwe's busiest border post with a total of approximately 170,000 people, 2,100 buses, 25,000 private cars and 15,000 trucks passing through the town every month (ZIMRA Beitbridge Regional Annual Report, 2015). The major formal commerce in the town include banking, retailing and freight industry. As a border town there is a lot of goods movement hence freight industry is one of the thriving sector. The informal sector activities are primarily vending where the sale of various food items (can drinks, fruit juice, groundnuts, maize cobs, wild fruits, etc), cell phone top-up cards and clothing flea markets is dominant. On

the other hand, illegal trading in hazardous substances such as diesel and petrol is common among the youths. Illicit beer drinking, buying and selling from cabins popularly known as *mashabini* is rife. It is from this context that the current SWM challenges that the town faces need to be understood.

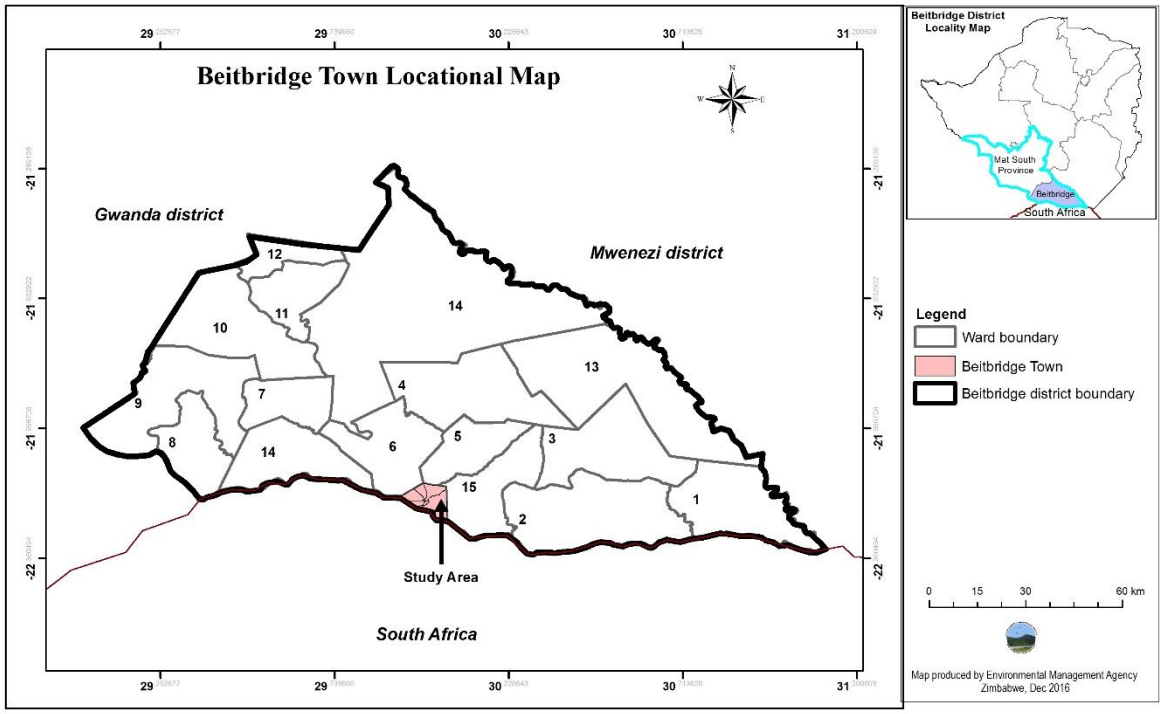

Figure 1:- Locational map of Beitbridge Town in Zimbabwe

Research Methodology:-

A case study approach was used to establish the emerging SWM challenges confronting the urban local authority. Primarily, this exploratory enquiry utilised a participatory methodology that drew from public insights and opinions about the unfolding scenario from the broad perspectives of SWM, economic situation and local governance. Within this approach, it was also necessary to conduct stakeholder identification and analysis. Scholarly review previously highlighted brought key SWM issues that other cities and towns are grappling with and enabled us to compare with the BTC situation. In deploying the participatory methodology, we allowed an open discussion of key challenges and the solutions thereof from the stakeholder perspectives. In order to enrich the evidence gathered from the perspectives of the participants engaged, it was also necessary to triangulate the methods of data collection with observations and reports, mainly from BTC and EMA. Participatory field visits were also carried out to observe the current practices from waste generation, collection and disposal at the border area, bus termini, residential areas and the town centre. The engagement of stakeholders in field observation facilitated interactive discussion to understand some emerging issues that required further probing. We also used reflexive pragmatism in analysing the qualitative expressions that were gathered from public submissions in a multi-stakeholder consultative meeting and in an expert discussion with BTC officials and the District Administrator of Beitbridge. The field work took two days of close interaction with participants who had been mobilised by the EMA district office of Beitbridge. Where necessary, follow-up observations were carried out by the EMA district personnel to understand questions raised by the research team.

Stakeholder identification and analysis:-

This study defines stakeholders as key individuals, group of persons or institutions with an interest in SWM system of BTC. The intention of conducting a stakeholder analysis was to identify key persons, groups or institutions with an interest in SWM and to assess how their interests may affect its success. As such, it was necessary to adopt ODA's (1995) classification scheme of primary, secondary and external stakeholders (see Table 1). The roles of these stakeholders in SWM are also specified in the table. The stakeholders consulted included the municipality officials, government departments, business community, residence associations, schools, non-governmental

organisations (NGOs), Community Based Organisations (CBOs), and youth and women groups. As shall be seen later, understanding these various groups is important in determining their respective roles in the proposed integrated solid waste management framework.

Table 1:- Typologies of stakeholders in BTC's SWM system.

Stakeholder type	Stakeholder	Role
Primary	Residences	-Practice source reduction and source segregation -Cooperate with civic bodies in identification of sites for waste management facilities and their operation -Pay for waste management
Secondary	Beitbridge Town Council	-Town wide solid waste management -Keep waste management in priority -Provide infrastructural inputs and services -Have a definite organizational setup with trained staff -Implement legislation and punish violators -Compliment public/private participation -Enlist informal sector participation -Maintain an up-to-date database
	Councillors	-Elected representatives of the citizens -May exert control over the local management of ward level sweeping and cleansing -Work with local organisations such as NGOs & CBOs -Lead the 'Clean up' campaign and work in unison towards the interest of a 'Clean' town -Pressurize the municipal authority to make the 'Clean City' issue a priority
	Business community	-Inculcate a culture of cleanliness to employees and take serious actions on cleanliness within the office/factory premises. -Provide dustbins outside the office/company premises so that the passers-by do not throw garbage on the road -Sponsor 'Clean Up' programmes
	Residence associations	-Localized solid waste management initiatives -Community mobilization in solid waste management -Putting pressure on municipalities to improve on service delivery
	Non-governmental organisations	-Labour-market & socially oriented agenda, such as working with street children, youths and women -Take lead in forming ward committees and community participation -Network with the other similar minded organizations in the area and integrate the efforts rather than duplicating most of the jobs -Involve unemployed youths in the area for various jobs -Organize/sponsor 'Clean Up' campaigns
	Faith-based organisations	-Awareness raising on waste management to congregants -Adopting sites for cleaning
	Community-based organisations	- Individuals & groups who make a living by collecting reusable or recyclable materials from households, waste transfer points or dumpsite.
	Schools/ teachers	-Influence minds on the culture of solid waste management -Inculcate a strict discipline in the children's mind with regard to solid waste -Carry out relevant research and development initiatives
	Youth	Take up various opportunities of part/full time employment that the 'Clean Up' campaigns would open for them, These include: • Managing collection of garbage • Helping the organizers in conducting road shows • Helping the promotion on clean-up operations
	Shop-owners & vendors	-Ensure that the waste/litter is properly put in a nearby garbage bin -Ensure to keep small garbage bin outside the shop or area of operation

		-Ensure that their customers do not throw the garbage just outside the shop or working area
	Zimbabwe Revenue Authority & Immigration	-Keep the border area free of litter -Organising clean up campaigns in the border area.
External	Nearby communities/ transit population	No direct role, but are also generators of wastes
	External Support Agencies	No direct role, but their support may help in boosting economic activities and revenue generation by the local authority

It emerged from the multi-stakeholder workshop that the SWM system of the town consisted of formal stakeholders and informal ones. Formal stakeholders included the local authority, government departments, and civic organizations of residents associations, NGOs, CBOs, churches and youth groups. Waste pickers or 'scavengers' constituted the informal stakeholder group. Participants in the meetings acknowledged the central government and local authorities as the most important stakeholders who set up policies and provide SWM services, respectively. The civic organizations were also regarded as important stakeholders in supporting and putting pressure on SWM while the service users such as households and the commercial sector were recognized as instrumental in changing the mindset or attitudes of people in waste management. Less represented were political parties, health care centers and the media fraternity. The informal stakeholders included junk shop owners, locally known as *mashabini* and the external communities from the nearby rural areas. The next section presents the SWM system of the border town before analyzing a portfolio of drivers and barriers for sustainable waste management.

The solid waste management system of BTC:-

This section presents the challenging situation of SWM in BTC from the views of stakeholders. It starts by highlighting the SWM system of the town as consisting of waste generation, collection, recycling and disposal. It then discusses the main drivers of poor SWM and the current waste management practices in the town. Also critically argued here is that the current waste management practices pose serious public health threats to the Beitbridge community and the transit population. Essentially, the section also gathers views raised by stakeholders to propose solutions to the issues.

Waste generation and collection:-

As part of the SWM system, waste generation is an important element deserving adequate analysis (Chanza & Chirisa, 2011). Given the direct relationship existing between population and waste generation (Tevera *et al*., 2003; Mbiba, 2014), and the demographic force pointed out earlier, it is evident that the quantities of waste generated continue to rise in BTC. The situation poses a collection challenge on the responsible local authority. The main sources of waste in the town are identified as: the border area, the town centre and the residential areas. The border area is mainly characterised by polyethylene terephthalate (PET) from water bottles and juices, plastics from snack packaging and paper. In this area, the Zimbabwe Revenue Authority (ZIMRA) has taken it upon itself to make sure the area is litter free. The municipality also supports this initiative through offering consistent collection services. Evidently, it can be learnt here that where key stakeholders have an interest, collective effort can address the challenges in SWM.

Similarly, the town centre is well attended to in terms of collection services. There are adequate receptacles in this part of the town. However, the situation is not the same as one moves to other places outside the border area and the town centre. The residential area is the most problematic. Community members dump their waste on illegal dumpsites and sites formerly designated for waste sorting. Figure 2 gives a trend analysis in incidences of illegal dumping in three selected wards that were monitored by EMA in 2016. This situation was observed during a stakeholder tour of the town. The team noted that aside from non-collection of waste, Ward 6, Garikai and the GD254 areas did not have ablution facilities. As a result, residents in these areas were resorting to the use of plastic bags to dispose of human waste. Participants engaged in an expert meeting to map the way forward unanimously agreed that if left unabated, the situation was likely to trigger a similar public health disaster that affected the town in 2008/2009. Upon in-depth interrogation, we discovered that the municipality violated the provisions of the Urban

Councils Act that forbids the parcelling out of residential stands in areas that have no basic facilities such as sewer and water. In addition, legislation gaps also exist in the operations of the town council. BTC is yet to embrace the principles of sustainable waste management practices as it is still to formulate by-laws that govern public and institutional behaviour in waste management. Yet, just across the border in Musina, the local authority prides itself of a functioning robust legal and institutional framework that regulates waste management.

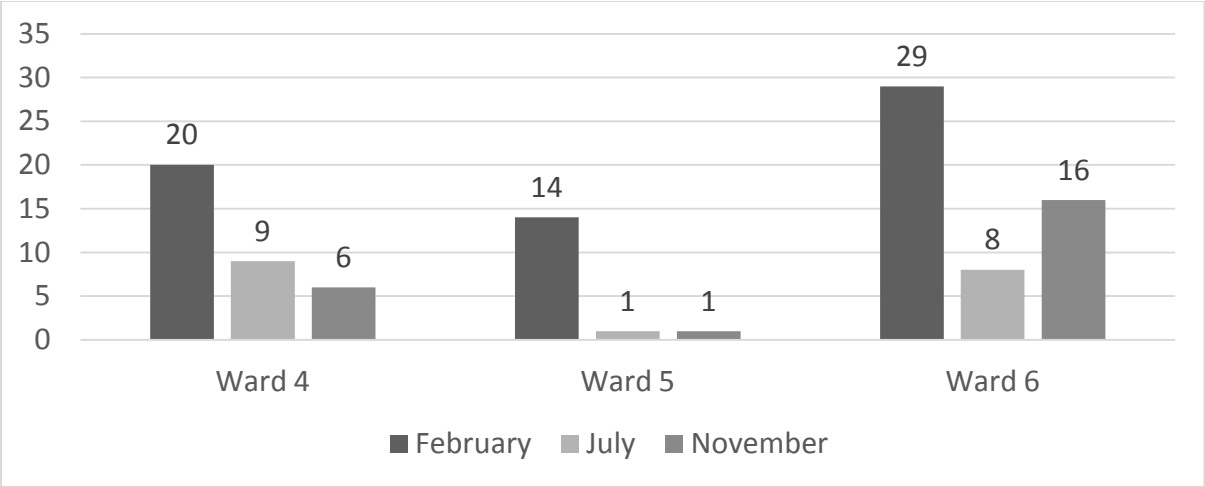

Figure 2:- Trends in illegal dumping in wards 4, 5 & 6 in Beitbridge, 2016

Waste recycling and Disposal:-

Overall, a study commissioned by EMA laments the low levels of waste recycling in the country. Given that just about 10% of the waste is recycled, much of it is crudely dumped at unsanitary landfills or disposal sites (IES, 2014). Beitbridge typically exhibits this rudimentary practice. Like most local authorities in Zimbabwe, Beitbridge lacks a properly engineered landfill. The waste disposal site currently in use is an open dumpsite without a boundary fence. On visiting the site, we observed that scavengers just enter and leave the dumpsite at will. Some have even established homes within the boundaries of the dumpsite. All waste types ranging from plastic, bottle, metal, paper and electronic waste find their way to this dumpsite. Waste collectors could be seen taking away PET, and low and high density polymers for recycling. The dumpsite also houses waste from Lutumba, a nearby rural service centre located 20km from the town. However, plans for the establishment of a standard sanitary landfill are at an advanced stage. The local authority has since applied for an Environmental Impact Assessment to EMA.

Drivers of poor solid waste Management:-

Understanding past and current issues in waste management is important in determining how best to move forward in developing sustainable waste management systems for the BTC. Two underpinning groups of drivers are institutional and responsibility issues as well as public awareness (Wilson, 2007). With reference to BTC, we agree with earlier observations by Tevera (1991) and lately by Jerie and Tevera (2014) that there is no one single driver for poor waste management. Instead, as summarized in Figure 3, economic challenges combine with institutional complacency and incompetency, demographic pressure and behavioral issues in stymieing effective SWM in the study area. While the municipality highlighted inadequate financial resources to fully equip the waste management unit, occupancy of unserviced stands and unregulated business enterprises have worsened the situation. We blamed this development on poor planning by the town authorities. This situation deserves critical assessment where, for instance, Ward 6, proudly exhibits high quality housing with very expensive building materials that are imported from South Africa. However, it is worrying to note that these leafy suburbs do not have ablution facilities.

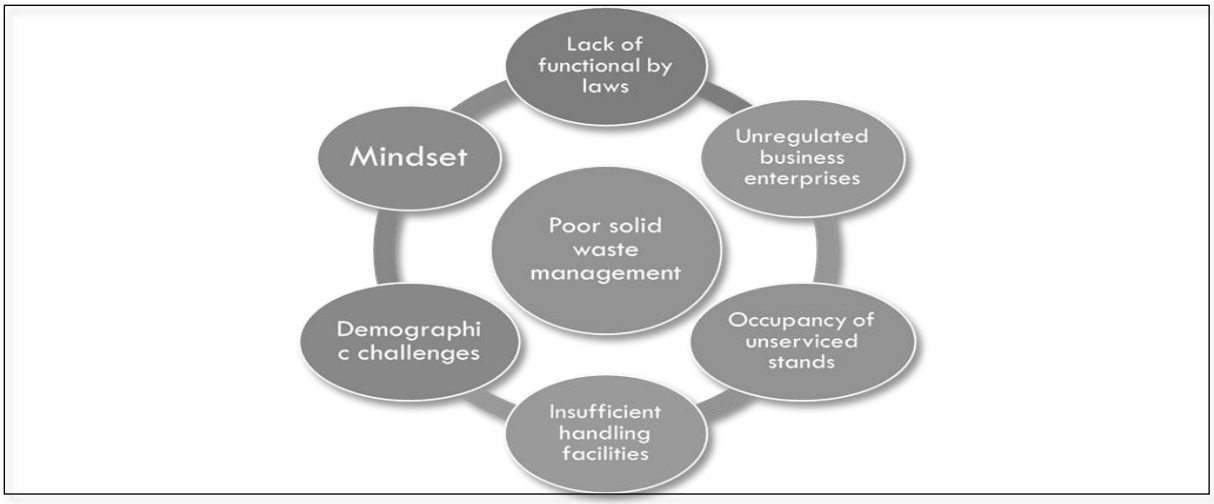

Figure 3:- Drivers of poor solid waste management in BBT.

With the aid of insights from key stakeholders engaged, the present study further categorised these factors into technical, environmental, political/legal, institutional, economic and social. An attempt to show how such factors constrain SWM is collated in Table 2. It should also be known here that these forces are not mutually exclusive. Non evaluation of environmental impacts of development projects, for example, combines with limited technology and financial resources to cause institutional inefficiencies, which ultimately results in poor SWM.

Table 2:- An explanation of poor solid waste management in BBT.

Category	Explanation
Technical	• Non availability of suitable infrastructure and equipment • Absence of low cost technologies for use in recycling initiatives • Technologies and reliable solid waste generation databases • Absence of infrastructure for safe disposal of waste
Institutional	• Outdated strategic plan • Low priority to solid waste management issues • Absence of by-laws • Occupancy of unserviced stands making collection of waste difficult • Unregulated business enterprises • Insufficient waste collection and handling facilities • Weak co-ordination among key agencies, private sector and other key stakeholders
Economic	• Lack of financial resources • Limited participation by the private sector • Limited willingness to pay for the transit population • Inadequate economic instruments
Social	• Inadequate cooperation between service providers and service users • Societal apathy for participation • Inadequate knowledge on benefits in waste sorting at household level • A waste through away behaviour
Environmental	• Non availability of environmental control systems • Non evaluation of Environmental Impacts
Policy	• Inadequate waste management policies • Weak regulations • Inadequate legislative frameworks for solid waste management

In summarising the major factors that underpin solid waste management in the town, it is critical to note the following:

- The BTC's by-laws are now outdated and need revamping. They were made, passed and adopted before the town's expansion and before the transit population had risen to the current numbers.
- The BTC has an acute shortage of funds. This creates a hazardous paralysis such that even when the Council knows what they ought to do to protect the environment, they remain paralysed because they have no money with which to do anything much.
- The BTC fails to cope with waste generated by the town's households, let alone to cater for the additional waste generated by the population in transit, and waste generated by the squatter traders who live in illegal shacks and by the new residential households that have neither toilets nor running water.
- The BTC area has become a multi-cultural melting pot thereby posing a challenge to effective environmental communication necessary for environmental change. Construction of meaning is a culturally based process and it is clear that BTC is not yet practicing culturally sensitive environmental communication. Sadly, one cannot say or predict that BTC will embark on culturally sensitive environmental communication in the near future to cater for their multi-cultural communities.

Some key reflections from public engagement:-

Notwithstanding the apparent limited resources, the Environmental Committee that the researchers met in Beitbridge was quite enthusiastic for things to be done properly. However, it was re-assuring to see that the residents of Beitbridge had organized themselves into community groups that were operational at ward level. Every ward has such a committee. They were talking very passionately about their environment. These groups were led by champions whose concern levels about environmental issues were very high. This scenario of champions conforms to the well-documented and world accepted participatory approach. According to Cox (2013:27), "local residents who complain to public officials about pollution or other environmental problems and engage their neighbours to take action are the most common and effective sources of environmental change." There was no lack of such "local residents" in Beitbridge. These community groups expressed dismay at the adverse environmental change that had set in and that continued to worsen on a daily basis. To them, the BTC could not cope with the amount of waste. They then viewed the researchers as a "listening ear" whose presence presented to them an opportunity not to be missed. An opportunity to pour out and expect intervention in return.

It is pertinent to consider the factor of the public sphere here, specifically. The public sphere always plays a key role where community individuals negotiate a topic of public concern in order to construct and attach individual meanings to the debate. The public meeting became a platform for public negotiation as the individuals in Beitbridge engaged others in communicating about the environment. During this negotiation and debate at the public meeting, they did not always agree on every point that was raised. They argued, debated and seriously questioned the conduct of their neighbours and service providers. For instance, one questioned why their neighbours would burn litter on the pretext that those supposed to collect waste would have failed to do so. Such a practice, they argued, would contaminate the atmosphere and affect public health of innocent victims in their neighbourhood. The study noted that although this waste burning issue was raised, nobody in the meeting responded (in support or otherwise) because it was now a question of two compelling pressures: the need for good environmental stewardship on the one hand and the need for disposing off litter that would end up accumulating if left uncollected. Clearly, all the participants in the public meeting shared concern on their Beitbridge environment.

Some policy Directions:-

The need for continuous monitoring of the hotspot zone is inevitable. It is recommended that EMA, as the regulatory authority, should have regular engagement with BTC. Such engagements should set targets on environmental protection and community engagement where the subsequent visits will evaluate and measure achievement of the agreed performance levels. Furthermore, effective SWM depends on having a relevant, reliable and up to date information system that has a built in adaptive mechanism for its continuous monitoring and improvement. Similarly, institutional arrangements for the interaction of three key ministries with waste management mandates (Ministry of Environment, Water and Climate, Ministry of Local Government, Public Works and National Housing and Ministry of Health and Child Care) should be pursued through the Inter-ministerial Committee on pollution. This collaborative attention to the problem will help in setting agreed and traceable priorities within the mandates of these institutions. On the other hand, local authorities should ring-fence refuse rates to effective integrated SWM for a clean, safe and healthy environment to be achieved.

Specifically to BTC, the following calls should be treated as urgent:-

- There is need to develop an updated Local Environment Action Plan as a blueprint that can be used for resource mobilization of their priority environmental concerns.
- The BTC should read, understand and apply the requirements of the Regional Town and Country Planning Act as well as the Urban Councils Act. Added to this, BTC should revamp and modernize its by-laws.
- The Government of Zimbabwe, United Nations agencies and other NGOs should be engaged to mobilize funds to assist the local authority.
- The Local Environmental Community Groups (those found in every ward as mentioned supra) should be assisted financially, materially and with constant and consistent training.
- The whole area in the jurisdiction of BTC should be permanently marked as a national "hot" spot or "red" zone on environmental matters till the situation improves. This way, it is hoped, the responsibility of ensuring good environmental stewardship becomes of national priority because a disease outbreak in Beitbridge will immediately feed into the rest of the country in a short space of time.
- There is need for regular public environmental awareness campaigns through marches and "road shows" within the BTC area. Such a march could traverse the border area, the town, Dulibadzimu Township, the bus terminus and the newly built residential areas.
- The Ministry of Local Government needs to compel BTC to ring-fence funds for environmental activities and responsibility.
- The BTC needs to clear its current dumpsite and make use of a properly engineered landfill.

Conclusion:-

From the lens of solid waste management, it is critical to highlight that Beitbridge has become a hotspot zone. The town exhibits unique SWM challenges that have not been adequately put to policy and scholarly attention. Critical to understand here is that the public is increasingly becoming aware of its environmental rights that are enshrined in the National Constitution. As such it is pertinent to use the public as a tool to understand the problem of SWM and to proffer solutions to the problem. Such an approach would assist in addressing the problem in many ways. For example, aside from engaging the public to check their sensitivity and awareness levels on issues that affect their environmental rights, the combined voice of the public can be loud enough to sensitise the relevant stakeholders to urgently tackle the problem.

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