

Indigenous Waste Management Practices for Disposable Diapers in Bushbuckridge Local Municipality: Traditional Responses and Environmental Implications

Benet Siyabonga Madonsela

Abstract— The proliferation of disposable diapers in rural communities presents a growing environmental challenge, especially in areas with limited access to formal waste management infrastructure, such as Bushbuckridge Local Municipality. Against this background, the current study sought to investigate the indigenous solid waste management practices of rural communities in the Bushbuckridge Local Municipality (BLM), Mpumalanga Province, South Africa, with a focus on how disposable diapers are managed. To achieve this, a total of ten case study sites were purposefully selected to capture the spatial and cultural diversity of indigenous waste practices across BLM. Data were collected using ethnographic research methods, including focus group discussions, while the thematic analysis approach was employed to analyse the data, and an inductive logic approach guided the interpretation of findings. The results of the current study indicate that indigenous communities of Bushbuckridge Local Municipality, in the absence of formal waste management services from the local authority, resort to indigenous knowledge practices to disposable diapers. Diaper burning (100%), open-air dumping (60%), pit latrines (45%), and backyard pits (100%) are some of the pervasive waste management practices employed by the rural communities of BLM. Statistical analysis further indicates no significant variation in diaper disposal practices between communities ($p > 0.05$), confirming the homogeneity of these behaviours across BLM. However, there are concerns that despite the sustainability aspect associated with the indigenous knowledge systems, these disposal methods in the rural communities of BLM might be reversing the gains associated with sustainability. Given that current diaper disposal practices rooted in indigenous responses are contributing to environmental degradation. This is a setback for an indigenous knowledge system that is supposed to advance environmental sustainability practices.

Keywords—Disposable diapers, waste management, indigenous knowledge, indigenous waste management methods.

I. INTRODUCTION

Modern-day society is grappling with numerous and complex environmental issues. In response to the extensive detrimental effects of human activity on surrounding

ecosystems, various governments and local authorities have enacted laws and policies to promote sustainable development. To this end, Petraitis [1] posits that governments and municipalities should not be seen as the panacea for environmental challenges. This is the practice that modern-day society can adopt from the indigenous communities. In indigenous communities, the practices associated with waste management are not exclusively designated to certain agencies; rather, they are regarded as a collective responsibility shared by the entire community. This communal approach is embedded within the cultural norms, values and traditions. It is important to highlight that long before the advent and institutionalisation of Western science, indigenous people had developed adaptive methods for managing waste that were deeply embedded in their cultural background and environmental knowledge [2]. These methods were not arbitrary rather influenced by generations of practical experience and skills derived from daily interactions with the environment. Such practical experience and skills have been critical in assisting indigenous communities in managing waste in the most efficient way possible for centuries [3]. That is in the context of managing waste in a manner guided by cultural taboos that respect the environment. In the African context such taboos have contributed for instance to environmental conservation through taboos (prohibiting certain activities in designated areas), promoting natural resources or systems preservation by demarcation of sacred areas such as water bodies through ancestral values, biodiversity preservation through totems (humans identifying with non-human objects believed to have spiritual significance) [4]. It is for this reason that scholars such as Madonsela et al. [5] emphasise that prior to the institutionalisation of Western practices, indigenous knowledge systems valued nature and promoted a balanced ecosystem for the benefit of future generations. While indigenous solid waste management practices have historically been associated with promoting the protection of the environment and sustainability, the introduction of non-biodegradable modern materials such as disposable diapers have disrupted these systems. This corroborates the postulation that in the indigenous communities the waste

This work was supported by the Conference Committee (ConfCom) funding instrument of the Cape Peninsula University of Technology. Benet Siyabonga Madonsela, Cape Peninsula University of Technology, corner of Hanover and Tennant Street, Zonnebloem, Cape Town 8000, South Africa

composition has evolved [6]. As a result, indigenous communities without access to basic waste management services provided by the local authority find it hard to cope with the growing burden of modern waste. This is not startling, given that indigenous knowledge relies on intergenerational succession. That is, the knowledge and the skills of the former generation are the bedrock of indigenous knowledge. Thus, the current study contends that the struggle of the present generation with the sustainable management of disposable diapers could be rooted in the legacy of the earlier generations. A generation that struggled with the management of disposable diapers, given their historical reliance on nappies. Nevertheless, the struggle is expected to continue, given that in the modern day, the usage of disposable nappies has gained momentum; given its benefit to child health [7]. However, although the usage of diapers is associated with convenience and comfort benefits, it has become an environmental and health risk for marginalised communities without access to formal solid waste management services. To this end, Mudau [8] affirms that the usage of disposable diapers contributes substantially to household waste and environmental pollution, especially in rural settings that lack adequate waste disposal services. Moreover, the projections complicate matters worse, given that the amount of diapers is expected to increase in the coming years. To this end, Ssemuusi et al. [9] describe diaper management as an emerging and significant public health concern that needs attention. To respond to this clarion, it is critical to consider integrated waste disposal methods of diapers that incorporate both modern and indigenous waste management practices. Before integration, it is fundamental that marginalised indigenous knowledge practices employed for disposal of diapers are critically scrutinised. This is important for low- and middle-income countries in order to contribute meaningfully to the betterment of solid waste management, especially in marginalised rural communities where formal waste management services are absent. Thus, the current study aimed to assess the indigenous waste management practices for disposable diapers in Bushbuckridge Local Municipality, with a focus on traditional community responses and environmental implications.

II. METHODS

A. Study area

The present study was conducted under the jurisdiction of Bushbuckridge Local Municipality. The rural villages in Bushbuckridge Local Municipality are under tribal authorities, given that they live on tribal land. The municipality is made up of two former apartheid homeland governments, Lebowa and Gazankulu, which were historically divided according to ethnic groups. The premise is that different ethnicities and language groups with diverse cultural backgrounds in BLM may present diverse indigenous knowledge practices of diaper waste management. The selection of the BLM indigenous communities (Figure 1) in the current study is justified by its prominent cultural diversity status.

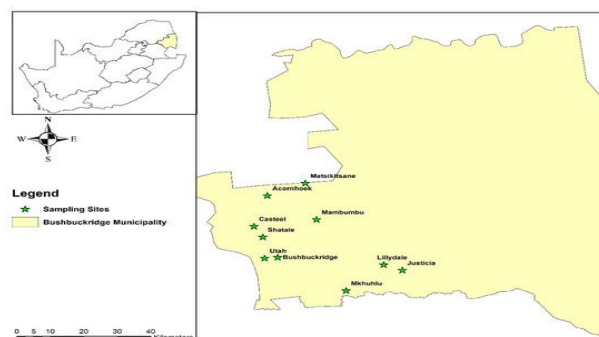


Fig. 1: Sampled Indigenous communities of BLM.

B. Research design

The present study employed an ethnographic qualitative research design to explore waste management practices within Indigenous communities. This approach was selected for its capacity to investigate complex social phenomena within their natural, real-world settings to understand the Indigenous communities' set of socio-cultural factors that influence certain practices of waste management.

C. Data collection methods

To collect data, the current study employed focus group discussions with members of Indigenous communities. This method allowed participants to express their views collectively and engage in dialogue around shared experiences and beliefs related to diaper waste management pathways. Focus Group Discussions were useful given their role in capturing community dynamics, group norms, and culturally rooted practices, offering valuable perceptions that individual interviews might not reveal.

D. Study population, selection criteria and sampling technique

In the current study, ten community groups were selected to represent case studies within the Bushbuckridge Local Municipality. These included Justicia, Matsikitsane, Shatale, Mambumbu, Lilydale, Bushbuckridge, Mkhuhlu, Acornhoek, Casteel, and Utah. (Figure 1) To this end, Bushbuckridge Local Municipality was used as the gateway to these Indigenous communities by providing the database containing details of all the environmental clubs within the jurisdiction of the study area. The BLM database contained the names of the environmental clubs, their contact details as well as their geographical locations. The selection strategy that was used for the environmental clubs is a non-probability sampling technique, as the probability of every group from the study area being selected was not known or guaranteed. Thus, purposive sampling was used as the sampling technique to select focus groups at BLM.

E. Data analysis

In this regard, the collected focus group data in the form of audio recording discussions from the community groups were systematically categorised into excerpts. That is, the audio recordings were first transcribed. Subsequently, the data were grouped according to themes. In this regard, the inductive coding approach was instrumental in realising this process. This helped to discover the themes and patterns of the data as

they emerge. The collected data was analysed using IBM SPSS Statistics version 28.0.

F. Validity and Reliability

To ensure the validity of the content, the focus group questions were developed to align closely with the study's objective, drawing on relevant literature and cultural context. Uniformity in data collection procedures across all focus groups enhanced the reliability of the current study. All sessions were conducted via a standardised discussion guide, and audio recordings were supplemented with comprehensive field notes.

III. RESULTS AND DISCUSSION

The discoveries from Bushbuckridge Local Municipality show that backyard pits, burning open-air dumping and pit latrines (Figure 2) are the fundamental methods that are commonly used as the final disposal destination for disposable diapers within the indigenous communities of Bushbuckridge. Statistical analysis further indicates no significant variation in diaper disposal practices between communities ($p > 0.05$), confirming the homogeneity of these behaviours across BLM. This observation in BLM is not an isolation rather reflects the African microcosm practices of disposable diaper methods across the continent. In light of this, Mudau [8] suggests that open dumping, burying, burning of waste, and other methods, such as pit latrines, are some of the common diapers dumping practices in most developing countries.

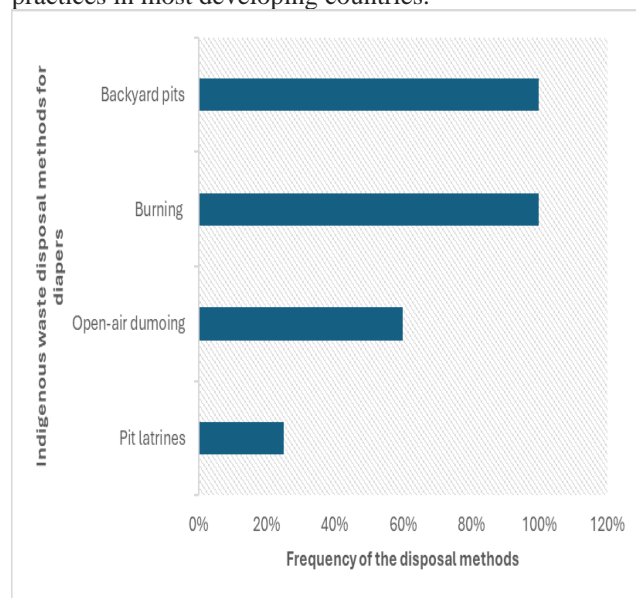


Fig. 2: Indigenous disposal methods of diapers within the communities of Bushbuckridge Local Municipality

From Figure 1 above, it is clear that backyard pits (100%) and burning practices are the preferred indigenous disposal methods of disposable diapers across the communities of Bushbuckridge Local Municipality. This practice of burning has seemingly become popular across the Southern African countries. To this effect, Ntekpe et al. [10] contend that open burning of diapers is a popular practice, given that it comprises 40% of total disposal methods in Zimbabwe. Following burning, open-air dumping is emerging strongly at

60% as the preferred disposal method of managing diapers. While the usage of shallow backyard pits (100%) presents minimal environmental and health risks, the burning (100%) and open-air dumping practices of disposable diapers are widely associated with environmental and health risks [11]. The risks and implications associated with thereof range from air pollution, health nuisance, to pollution of water resources [12]. These practices must be discouraged, given that in vulnerable communities, open-air dumping can exacerbate communicable diseases such as cholera outbreaks. While in contrast, the usage of the traditional pit latrines (22%) might seem as the best practicable environmental option for sanitation, it is not a popular option amongst the indigenous communities of BLM. A majority of respondents reported that disposing of diapers in pit latrines leads to rapid filling of the pits. This is primarily because disposable diapers expand when exposed to moisture, thus reducing the functional lifespan of the latrines and increasing the frequency and cost of digging more pit latrines. This is a struggle for marginalized indigenous communities struggling to make ends meet.

IV. CONCLUSION

The realities observed in Bushbuckridge Local Municipality reflect broader systemic gaps in diaper waste management within rural and marginalized communities. These disposal methods are often shaped not by choice, but by lack of access to proper waste infrastructure and limited economic means. As such, they continue to pose serious environmental and public health concerns. There is, therefore, an urgent need for practical, affordable, and culturally acceptable interventions that align with the lived experiences of Indigenous populations.

REFERENCES

- [1] Petraitis, S. Which nappies are better to use from an environmental point of view?. 2020.
- [2] Ajibade, L.T. Indigenous knowledge system of waste management in Nigeria. *Indian J. Tradit. Know.* 2007, 6, 642–647.
- [3] Madonsela BS, Machete M, Shale K. Indigenous knowledge systems of solid waste management in Bushbuckridge rural communities, South Africa. *In Waste* 2024 Aug 7 (2), 293–311. MDPI. <https://doi.org/10.3390/waste2030017>
- [4] Mapira J, Mazambara P. Indigenous knowledge systems and their implications for sustainable development in Zimbabwe. *Journal of Sustainable Development in Africa*. 2013;15(5):90–106.
- [5] Madonsela BS, Semenya K, Shale K. A review of indigenous knowledge systems and their application in sustainable solid waste management. *World*. 2024 Apr 12;5(2):219–39. <https://doi.org/10.3390/world5020012>
- [6] Madonsela BS, Semenya K, Shale K, Maduna L. Sustainability of indigenous solid waste management practices in rural communities of South Africa. *Recycling*. 2024 Nov 16;9(6):113. <https://doi.org/10.3390/recycling9060113>
- [7] Nedondwe MO, Budeli AA. Exploring Indigenous Ways of Managing Informal Diapers Disposal in the Vhembe Biosphere Reserve. *In Resurgence and Revalorization of Indigenous Knowledge Systems in the Contemporary Society 2025* (pp. 173–194). IGI Global Scientific Publishing. <https://doi.org/10.4018/979-8-3373-4124-8.ch009>
- [8] Mudau LS, Thumbathi AM, Nkosi DV. Poor disposal of soiled diapers in Sub-Saharan Africa: A gap in environmental health literacy in rural

communities. In *Environmental Health Literacy Update-New Evidence, Methodologies and Perspectives* 2023 Nov 6. IntechOpen.

- [9] Ssemuusi A, Wafula ST, Musoke D, Kasasa S. Knowledge and management practices for disposable baby diapers among child caregivers in informal urban settlements in Uganda. *Journal of Water, Sanitation and Hygiene for Development*. 2024 Aug 1;14(8):670-81. <https://doi.org/10.2166/washdev.2024.019>
- [10] Ntekpe ME, Mbong EO, Edem EN, Hussain S. Disposable diapers: impact of disposal methods on public health and the environment. *Am J Med Public Health*. 2020; 1 (2). 2020;1009.
- [11] Ali N, Taib MR, Soon NP, Hassan O. Issues and management for used disposable diapers in solid waste in the city of Kuala Lumpur. *Perintis EJournal*. 2017;7(1):43-58.
- [12] Grangxabe XS, Madonsela BS, Maphanga T, Gqomfa B, Phungela TT, Malakane KC. An overview of waste management practices of street vendors in sub-saharan africa: A meta-analysis. *Journal of Environmental Management*. 2024 Jul 1;364:121464. <https://doi.org/10.1016/j.jenvman.2024.121464>