

Plastic Waste Management in Rural Eswatini: A Mini Review

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Abstract

This paper explored plastic waste management practices employed by rural households in rural households of Kingdom of Eswatini. It identified the types of plastic waste generated, estimated the average daily (and annual) amount generated, and established the different strategies employed by rural households in managing plastic waste. A semi-structured questionnaire, accompanied by an observation matrix, was used to solicit data from heads of households in Ezikhotheni and Zombodze emuva communities. Data on the types and amount of generated plastic waste (per household) were gathered for two consecutive months (December 2018 and January 2019) from the two rural communities. The results revealed that rural communities in Eswatini generate different types of plastic waste materials, and these include: Polyethylene Terephthalate (PET), High-Density Polyethylene (HDPE), Polyvinyl Chloride (PVC), Low Density Polyethylene (LDPE), Polypropylene (PP), Polystyrene (PS), Expanded Polystyrene (EPS) and other plastic waste materials layered from other plastic. On average, it was found that a rural household generates approximately 15.9 g of plastic waste per day, equating to about 5.8 kg per annum. Common plastic waste management practices found in these rural communities included; open burning, burying, reusing, disposing in backyard pit, indiscriminate disposal in the backyard, selling and upcycling. The study concluded that primitive traditional plastic waste disposal and management methods still characterize most rural households in Eswatini. However, modern and recommended plastic waste management practices were also observed in some households, particularly in Zombodze Emuva community.

Keywords: Plastic waste • Waste generation • Management practices • Rural households • Zikhotheni • Zombodze emuva

Introduction

The increase in the generation and use of plastic products has become a global concern and has become part of waste management agendas for most nations. The harm of plastics on the environment cannot be ignored, and the cost of its management cannot be underestimated. The defining characteristics of plastics make them convenient material for the manufacture of everyday products. Merino, Ayer noted that, of the global hike in solid waste to 9.1 billion tones, 6.9 billion tones (about 77%) is plastic waste. While plastic waste continues to be a major challenge to the environment and its production continue to characterize most countries of the global South, including Eswatini, its management remains poorly researched [1].

Common Plastic Types, their Environmental Effect and Management

The different types of plastics found in the environment are broadly divided into thermoplastics and thermosetting. Thermoplastics are the most common, and include: PET, HDPE, PVC, LDPE, PP, PS, EPS, and other plastic types. These different plastic types have different effects on human and animal life, and the environment. Plastic waste and its management challenges are not a unique feature of households in rural Africa, but a common global problem. Apostoli, Mihai observed that although rural areas tend to make most of the population in many countries, particularly in the global South, their governments tends to neglect the provision of waste management services in these areas. As such, most rural communities in most regions are still dominated by poor and illegal waste disposal practices, which results in complex plastic pollution. Uncollected waste in these areas tends to be disposed in improper dumpsites, resulting in pollution of the local environment. There is a consensus that plastic pollution is a major challenge for most countries in the global South [2].

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Plastic Waste and its Management in Eswatini

Eswatini is struggling with the control and proper disposal of waste in both urban and rural areas. As a result, the threats posed by plastic pollution on the population and environment have remained huge, with a large proportion of the population, including legislators and policy makers, ignorant of these threats. This lack of understanding has contributed to the unsuccessful initiatives/ attempts to ban and curb the use (and production) of plastic bags in the country. One such memorable initiative was the introduction of a plastic bag levy (plastic bag tax policy of 2015) by the Eswatini Environmental Authority (EEA) which sparked a major disagreement between government and citizens, leading to withdrawal of this policy initiative [3].

However, with the continued observation of the scale of plastic waste generation and improper disposal, Government of Eswatini, through the Ministry of Tourism and Environmental Affairs, in partnership with EEA and the United Nations Development Programme recently introduced another initiative dubbed #PhatsaSakhoNawe, loosely translated to 'Bring your own bag'. Its aim is to combat plastic littering from single use through having retailers not supply plastic bags to consumers on certain days of the week, instead, encouraging shoppers to bring along their own reusable and environmentally friendly bags. The initiative has been embraced as one of the national plastic management strategies, which highlights the magnitude and severity of the problem of plastic waste in the country, and the need for its reduction and proper management nationally [4].

In Eswatini, about 70% of the population resides in rural areas, and grappling with lack of waste management services. As highlighted, although most rural households continue to accumulate voluminous plastic waste, its disposal infrastructure remains a major challenge in rural Eswatini. The work by Nxumalo that is being reviewed sought to bridge this knowledge gap and contribute to the waste management discourse by identifying the types of plastic waste generated in rural Eswatini, estimating the daily (and annual) average amounts of plastic waste generated by a rural household, and establishing the disposal and management strategies employed by these rural communities using Zikhotheni and Zombodze Emuva communities as case studies [5].

Methodology

The study adopted a case study approach and used Zikhotheni and Zombodze Emuva as case study sites. Both communities are found in the Shiselweni region in the southern part of the Kingdom of Eswatini (Figures 1 and 2).

Data was sourced through a questionnaire, field observation guide and spring balances from all sampled households, with ethical considerations observed. Refuse bags were distributed to the households and the households

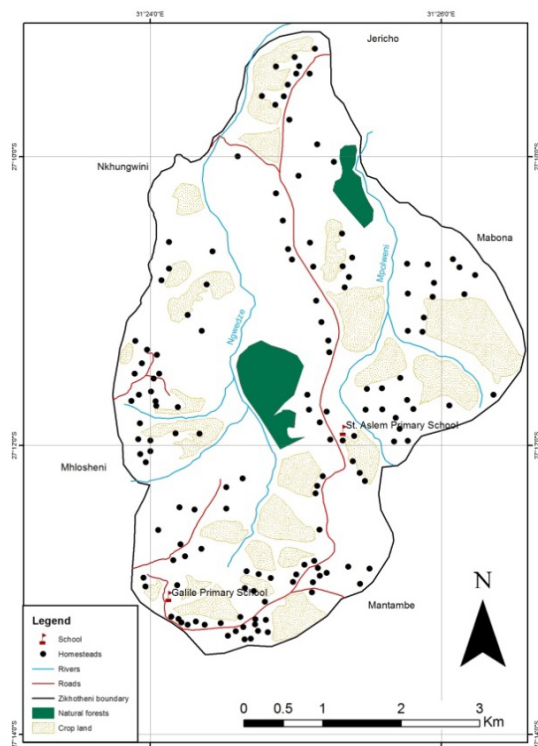


Figure 1. A map of Zikhotheni.

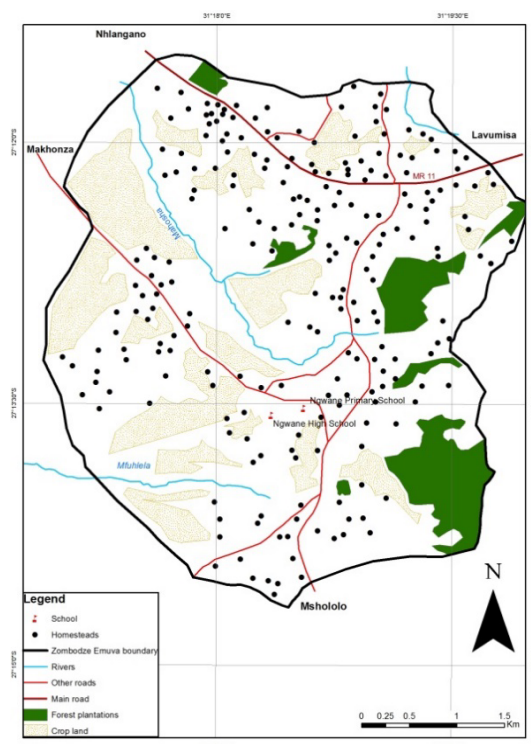


Figure 2. A map of Zombodze Emuva.

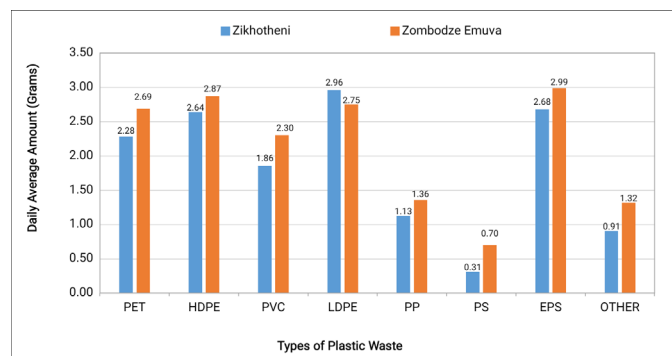


Figure 3. Average daily amount of plastic waste generated per household by community.

requested to dispose all their waste generated during the months of December 2018 and January 2019 in the provided bags. For each month, the generated waste was then sorted, and the plastic waste weighed. A questionnaire was further used to solicit the plastic waste management strategies employed by the households. Collected data was coded and analysed using the Statistical Package of the Social Sciences (SPSS). The results were presented using graphical techniques and tables, with narratives used to supplement the presented data [6].

Results and Discussion

Types of plastic waste and amounts generated in rural Eswatini

Nxumalo found that the types of plastic waste generated in the two case communities (Zikhotheni and Zombodze Emuva) were comparable, and they included PET, HDPE, LDPE, PVC, PP, PS, EPS and other plastic types which are layered from other plastic types such as bio-plastics (Figure 3). The study further averaged the daily amount of plastic waste generated in Eswatini t15.9 g/household, which is approximately 5.8 kg of plastic waste per household per annum [7].

Adopted plastic waste management practices in Zikhotheni and Zombodze Emuva

According to Nxumalo, plastic waste management practices adopted by the households of Zikhotheni and Zombodze Emuva were found to be comparable, and these included; open burning, reuse, burying, disposal in pit, and indiscriminate disposal in the backyard, and selling of plastic waste to recyclers and upcycling of plastic waste (only in Zombodze Emuva).

Nxumalo also observed that open burning is the key disposal practice in rural Eswatini, mostly in backyards and waste pits. However, this practice is no longer recommended as it releases toxic gases, including dioxins, into the environment, and these cause reproductive abnormalities, cancer and child development deficiencies, among others. The study also noted that all sampled households were reusing plastic waste generated for different domestic purposes. Interestingly, reuse of waste is the next recommended strategy (after reduction) as means to minimise the need for recycling, or at worst, landfilling [8,9].

Nxumalo further revealed that in most rural households, if waste was not burnt indiscriminately, it was indiscriminately disposal in backyard waste pits. Unfortunately, this too is no longer regarded a good practice, especially because these waste pits have the potential of harboring insects which may be dangerous to humans, such as mosquitoes which may hike malaria cases locally. Nxumalo also recorded that some rural households in rural reported that once a waste pit was filled up, they covered it with soil as means to 'avoid land pollution'. However, this too may lead to adverse environmental effects as plastic waste is not easily bio-degradable and has the potential to contaminate underground water. Indiscriminate disposal of waste in backyards without even using waste pits was also found to characterize most households in rural

Eswatini, a practice which is not also recommended by environmentalists [1,9].

Other than reuse, another recommended practice that was found by Nxumalo to be practiced in Zombodze Emuva community is upcycling of plastic waste, even though it is still at infancy stage. Upcyclers were found to use plastic waste material to make plastic mats, artificial plastic flowers, flowerpots, and children's toys. There were also few households who reported to generate income through selling of plastic waste in this community. However, none of these practices were found to be practiced Zikhotheni community. With the population of the country dominantly in rural areas, there is an urgent need for the country to reduce the use of plastics, and especially work towards the establishment of waste management systems in the rural areas [10,11].

Conclusion

Plastic waste remains a major challenge in rural Eswatini, with a household generating a daily average of 15.9 g, which is about 5.8 kg per annum. Plastic waste materials generated by rural households in Eswatini constitute different types, at different scales, and this was noted to be comparable across communities. Primitive waste management practices are the main forms of waste disposal in most rural households of Eswatini, with very few households engaged in modern and recommended waste management methods such as upcycling. Waste disposal infrastructure remains a major challenge in rural Eswatini, and proper waste disposal and waste management remains lacking.

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