



Mapping and Quantifying Plastic Pollution in informal settlements of urban Blantyre, Malawi

Taonga Mwapasa^{1*}, Tony Robertson², Dyson Kazembe¹, Andrew Mnkhwamba¹, Patrick Kalonde³, Nicholas Feasey⁴, Richard S. Quilliam², Tracy Morse⁵, Kondwani Chidziwisano^{1,6}



¹Centre for Water, Sanitation, Health and Appropriate Technology Development (WASHTED), Malawi University of Business and Applied Sciences, Blantyre, Malawi ²Department of Biological and Environmental Sciences, University of Stirling, Stirling, UK ³Malawi-Liverpool-Wellcome Trust Clinical Research Programme, Blantyre, Malawi. ⁴Liverpool School of Tropical Medicine, Liverpool, UK. ⁵Department of Civil and Environmental Engineering, University of Strathclyde, Glasgow, UK ⁶Department of Public Health and Environmental Sciences, Malawi University of Business and Applied Sciences, Blantyre, Malawi.



Email: tmwapasa@mubas.ac.mw

Introduction

- Globally, 400Mt of plastics are produced annually and over 75% of these end up in the environment
- 75,000 tones produced annually in Malawi, 80% is single use plastic.
- Majority of plastics are non-biodegradable
- Improper disposal of plastics is common in settings with poor waste management systems
- Mismanaged waste can spread infectious disease.
- Limited data on the dynamics of plastic waste hindering proper waste management initiatives

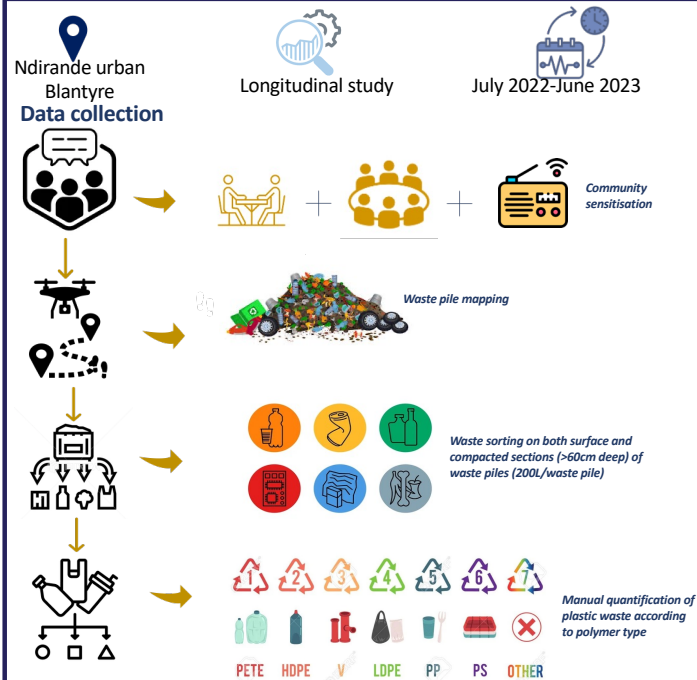
Aim:

Understand the spatial and temporal prevalence of different types of plastics in waste piles in informal settlement of Blantyre Malawi

Objectives:

- Map areas of plastic waste pollution
- Determine presence of plastic polymers on surface and compacted areas
- Quantify plastic polymers and compare with other waste types
- Assess impact of rainfall on plastic presence

Methods



Results

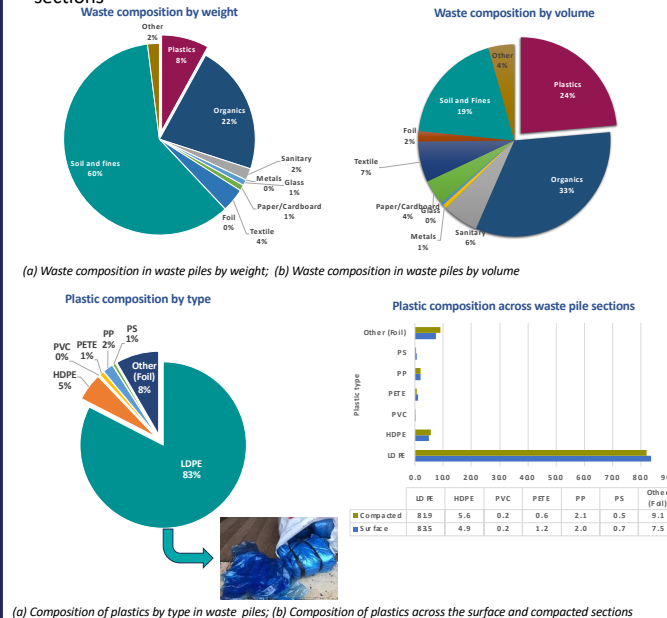
1. Waste pile mapping

- A total of 55 waste piles identified with 15 selected for the study
- Waste piles located along river-lines (50%, $n=7$), open dumping spaces (29%, $n=4$) and along the stream (21%, $n=3$).



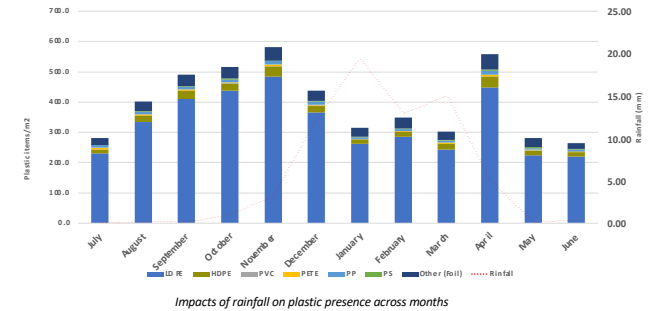
2. Waste composition and plastic quantification

- Ten waste categories were identified in waste piles.
- Plastics made up the highest non-biodegradable waste type by volume.
- Comparable plastic quantities across surface and compacted (>60cm deep) sections



Results

3. Impacts of rainfall on plastic presence



- High rainfall associated with reduced plastic volume signifying plastic transfer during the rainy season

Conclusion

- Improper waste disposal leads to waste piles along river lines, streams and open dumping sites
- Plastics make up the second highest composition of waste type by volume highlighting its abundance within waste piles
- No difference in plastic weight or volume in surface or compacted sections
- Low density Polyethylene (LDPE) plastics were the most abundant of plastics particularly the single use plastics
- High rainfall aids in plastic transport resulting in increased risk through the spread of plastics

Future research direction

- Comparison of plastic pollution across sites with different urbanization levels
- Assess the behavioral factors influencing the use and disposal of plastics.

References

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