



Plastic Bags Disposal and Recycling In East African Urban Centres- Case study Nairobi, Kampala

by

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INTRODUCTION

- Plastics are essential elements of industrialization and socio-economic development of a country
- Nairobi manufactures a total of **192,836** tones per year of plastics ; of which **25%** of the total manufacturing comprises of plastic carrier bags
- An additional **27,813-t/yr** of finished plastic products are imported into the city
- **100 million** plastic bags are handed out annually in Kenya by supermarkets alone
- Out of the annual plastic consumption in Nairobi, **18%** are retained and reused while **82%** is indiscriminately dumped into the environment (KNCPC, 2006).



- Approximately 50% of the plastic carrier bags are less than 15 microns in thickness, and are primarily used for carrying consumer products
- Most manufacturing companies consider them uneconomical to have them recycled and are therefore easily dumped in the environment in any place of convenience.
- About 30% is collected by Nairobi City Council and private waste handlers collect and dumped in Dandora (legal dumpsite)
- The rest is either dumped in illegal dumpsites, open burning or left littering the environment
- Plastic bags are non-biodegradable. They take between 15 and 1,000 years to breakdown in the environment



ENVIRONMENTAL IMPACTS

- When flimsy plastic bags are littered they are carried by rain storms and clog drainage and sewer lines and do not allow water to flow freely through the drainage systems causing flooding.
- This stagnant water also becomes a breeding ground for mosquitoes that cause malaria. According to the Ministry of Public Health and Sanitation (MoPHS), malaria kills at least 30,000 people annually mostly children under the age of five and expectant mothers and is the leading cause of outpatient morbidity accounting to about 30 percent of the total disease burden in Kenya.




- Plastic grocery bags also have the potential to **leach their chemical components and toxins into soil and water sources**, which can be passed on to humans, resulting in health dangers such as neurological problems and cancers
- Plastic bags are also poisonous when they are burnt below **800 degrees** celsius.
- They release toxic gases like dioxins and furans, which have lethal effects on human health and the environment; They been linked with **cancer** as well as the increase of **green house gases (GHG)**.
- Research shows that **60%** of stray cattle die due to consumption of polythene bags though the greater risk is to the soils and crops,

GOVERNMENT APPROACH

- The Minister for Finance (MoF) in the Finance Bill 2007, **Kenya Gazette Supplement No. 60 (Bills No. 26)** proposed the banning of the manufacture and importation of plastic bags of less than 30 microns and the imposition of 120% excise duty on all sacks and bags including cones of polymers of ethylene, other plastics sacks and bags used for packing goods (MoF,2007) .
- In addition, **section 42** of the Constitution provides a right to a clean and healthy environment for every Kenyan.
- The government has set up bodies like; the National Environment Management Authority (NEMA), there are also private entities like UNEP, ITDG that are all collectively addressing the issue of plastic wastes in the city



- They have basically adopted the 3R approach (re-use, reduce and recycling approach) that has sort to bring together all relevant stakeholders but there have encountered challenges
 - Gaps in information among relevant stakeholders, lack of practical application of sustainable solutions; low service coverage, inefficient public services, immense pollution from uncontrolled dumping, uncontrolled private sector participation, lack of transfer facilities, lack of segregation at source, lack of key solid waste management infrastructure and over reliance on only one official dumpsite
 - Significant level of private sector involvement in the solid waste collection services has been predominant in the middle to high-income households and business/industrial premises in the city, but minimal services exists in the informal settlements of the city that unfortunately hosts over 60% of the city population
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Illegal dumpsite in Nairobi





● Dandora dumpsite



Nairobi river choking with uncollected garbage; human waste from informal settlements; industrial waste




DANDORA DUMPSITE



Common Uses of Plastic Waste

- Plastics are used for weaving shopping bags, hand bags, and mats, beads
- The straws are normally used for making mats, bags, belts
- Some plastics are used for making poles
- Some plastic bottles are re-used for packaging drinks like juice and porridge, and at times herbal medicine.
- Plastic bags have been used for mushroom growing but on a very small scale
- f) As a common practice, some mineral empty bottles have been used for packaging dirty and unboiled water disguised as mineral water.



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- The **behavioral practices** of the residents of the Nairobi slums are largely unsustainable as they dump their wastes at their easiest places of convenience.
 - There is a need to raise awareness among the city slum residents to change their consumption patterns which could result in the minimization of plastic wastes.
 - This research applies appropriate technologies to develop multipurpose plastic blocks from plastic carrier bags (less than 30 microns which are not commonly recycled)

PRELIMINARY TESTS

Preliminary tests done;

- Separation and cleaning of the plastics
- Shredding of the plastics
- Sieve analysis
- The plastics weighed, melted in a crucible with the aid of charcoal fueled furnace and then mixed with weighed amount of sand.
- Moulding the plastics
- Mixing the plastic mould with concrete constituents
- Cast the concrete block and allowing it to dry





WAY FORWARD

• Collaborative research with a multidisciplinary approach- Joint funding – to move to another level of research;

- To conduct a **socio economic survey** on household and community level knowledge of waste segregation and characterization and to establish household and community dumping patterns and waste collection points
- Carry out extensive laboratory experiments on the plastic block (quantities required)- i.e particle size tests, Crushing strength test, Compressive strength testing
- The results compared to the conventional blocks in the market and the recommended standards by the ministry of works.
- Carry out capacity building and build awareness on plastic wastes reduction and source separation as core components of improved plastic waste management