
THE EFFECT OF PLASTIC WASTE ON THE ENVIRONMENT IN UGANDA, A CASE STUDY OF JINJA DISTRICT

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ABSTRACT

The study aimed at the effect of plastic waste on the environment in Uganda, a case study of Jinja district and it was guided by the following objectives; To examine the impacts of Plastic waste bags on the soil productivity of farming area, to identify the alternatives to Plastic waste bags and to examine the practices of incentivizing Plastic waste management for environmental sustainability. The target population of the study shall be 30 distributors, 08 policymakers, and 10 environmentalists, 10 members of the private sector/recyclers, and 100 consumers. The population described here was used to determine the sampling size. The analysis's results, which are displayed in the above table, demonstrate that the regression model accurately predicts the dependent variable. The statistical significance of the regression model is indicated by $F=114.231$ and $P=0.000$, both less than 0.05. More proof for this comes from the difference between the regression's mean square value, which was 8.607 initially, and the remainder's mean square value, which was 0.075. This illustrates how plastic trash and the environment are related. The general public should be made aware of efficient methods for managing waste and the harm that plastic wastes due to the environment. Plastics that are less detrimental to the environment should be replaced with alternatives and non-dangerous full bags.

Key words: plastic waste and environment

Background of the Research Problem

Since the development of plastic bags in 1907, there have been around 8.3 billion metric tons of non-recycled waste bags generated globally, with 6.3 billion metric tons of rubbish produced, 79% of which has been dumped in landfills and just 9% of which has been recycled (D'Ambrières, 2019). With the current trend of plastic and plastic waste management, it is predicted that by the year 2050, there will be approximately 12 billion metric tons of plastic waste in landfills or the atmosphere (Science Daily, 2017). As a result, the manufacture and consumption of single-use plastic will grow into a more significant global problem and a source of pollution (Winny et al., 2023). In line with a global trend,

the costs associated with managing plastic trash are growing ever clearer in their effects on society, the economy, and the environment. Companies and governments are being pressured by the smothering to respond more quickly to environmental realities, but despite their efforts, authorities in developing nations still tend to manage waste streams in a commercial manner rather than through the use of incentives. This creates a gap in the administration of plastic waste streams sustainably in different circumstances.

Even though the Hoima district must collect, transport, and manage waste in accordance with the local government Act of (1997) (decentralization policy)(Christopher et al., 2022), budgetary restrictions and inadequate infrastructure, such as garbage collection trucks, have impacted timely waste collection schedules and the cycle for collection and dumping. According to Nyakaana (2017), declining the handling of solid waste is turning into a significant environmental issue as a result of the population growth of 1,997,418 million people (UBOS 2014). This is because of poor solid waste management. Due to insufficient funding, poor waste management practices including burning, missing trash pickup, and landfilling have become more prevalent, having significant negative effects on the economy, society, and the environment that have an impact on the district's ability to develop and produce food.

Statement of the Problem

Plastic waste management is a global issue that has a considerable impact on social, economic, and ecological reality and on the outcome of agriculture in Hoima East Division. In line with (UBOS 2014). The district, which has a million residents, has been responsible for the production, shipment, and consumption of plastic-packaged foods and drinks including sugar and bread, which has polluted the terrain and marshes near Lake Victoria (Christopher, 2022). Every person is a potential source of plastic garbage, hence the lack of a successful system for managing solid waste has increased the amount of plastic pollution in the Hoima district even more (Kirunda, 2009). Due to inadequate soil aeration, little to no water penetration since the waste plastic does not breakdown, and soil fertility issues that result in low agricultural yield, this waste plastic seriously harms agricultural land (Kazaara & Christopher, 2023). Where waste is controlled, marketable actions have increased careless waste disposal, there are no incentive-based approaches for managing plastic waste, so it is in our best interests to consider the implications of poor handling of plastic waste in the Hoima district and what tactics can be

implemented to encourage the proper handling of plastic waste. This study will investigate the effects of plastic trash bags on agricultural output using Hoima East Division as a case study.

Specific Objectives

- 1. To examine the impacts of Plastic waste bags on the soil productivity of farming area.*
- 2. To Identify the alternatives to Plastic waste bags*
- 3. To examine the practices of incentivizing Plastic waste management for environmental sustainability.*

Research Questions

- 1. What are the impacts of Plastic waste bags on soil productivity of farming areas?*
- 2. Which alternatives can be used in the place of Plastic bags?*
- 3. What are some of the practices that would ensure incentivized Plastic waste?*

Methodology

Research design

A research design makes it possible to gather and analyze data in a way that attempts to balance relevance with the study goal. In order to assess how plastic garbage is managed in Hoima East Division, the study used a case study approach.

In order to study the problems related to managing plastic garbage, the research will use a mixed method that combines qualitative and quantitative methodologies.

The population of the study

Stakeholders in the manufacturing, distribution, and consumption of plastic bags as well as those involved in the disposal of plastic garbage were the focus of the study. Producers, suppliers, buyers, and the recycling team/companies in the Hoima district were all involved in this. 30 distributors, 8 legislators, 10 supporters of the environment, 10 representatives of the private sector/recyclers, and a hundred customers will make up the study's target audience. The Morgan and Krecjie formula (2016) were applied to the population mentioned here to estimate the sampling size.

Sample size

Sample is a subgroup in a population which can be used as a representative of the population to derive inferences about the Guidance of that population (Kingori, 2016). According to Mulusa (2015), at least 47% of the total population is representative. Therefore, the sample size

for this study shall be 30 respondents.

Table 1. The sample size for the respondents

Category of population	N(population)	n (Sample)	Sampling method
Distributors	30	9	Simple random sampling
Consumers	100	30	Systematic sampling
Policymakers/ Local Gov.	8	2	Purposive sampling
Environment professional	10	3	Purposive sampling
Private Sector/recyclers	10	3	Simple random sampling
Total	158	47	

Source: (field research 2021)

Sampling techniques and procedure

The study shall use both simple random sampling and purposive sampling techniques that we are able to address the quantitative and qualitative aspects of the study.

Purposive Techniques

To comprehend the experiences, knowledge, abilities, and thoughts of the participants, the study used purposive sampling approaches common to qualitative research. Purposive sampling, sometimes referred to as subjective assessment, was defined by Patton (2012) as a method that is frequently employed in qualitative research projects for recognizing and selecting material. This is the most efficient use of few resources. According to Creswell and Plano (2011), the research obtained opinions and levels of comprehending about the phenomenon that was under study from people or organizations who are skilled and knowledgeable (policymakers, producers, and environmentalists). These individuals and groups include policymakers and environmental groups because they have the necessary expertise to inform the study

Random Sampling Techniques

The study also shall use simple and systematic random sampling techniques to select some of the respondents for the study and these include; distributors, consumers, private sector/recyclers. This adopted to collect views and opinions from distributors and consumers of

the viability of incentivizing Plastic waste as a management practice.

Data Analysis techniques

Both qualitative and quantitative analysis will be used in this investigation. Direct observation, focus groups, questionnaires, face-to-face interviews, and content analysis were used to gather qualitative data. As a result, using it allowed the investigator to compile field data into a report of findings. The second stage involved analyzing and drawing conclusions from the condensed data from tables, bar graphs, pie charts, and snapping pictures. This was accomplished with the aid of the Statistical Package for Social Science (SPSS), which was used to get sum, mean, and distribution of frequencies (Nelson et al., 2022). The data was subsequently calculated and tabulated to provide a concise summary of the raw data.

RESULTS***The impact of sand mining on the environment***

The first objective of the study was to examine the impact of plastic waste on the environment and the findings from the respondents are as seen in the table 1 below

Table 1 showing the impacts of plastic wastes on the environment

<i>Impact</i>	<i>No of respondents</i>	<i>percentage</i>
<i>Reduction in soil fertility</i>	20	41.6
<i>Poor soil aeration</i>	8	17
<i>Low water infiltration</i>	10	21
<i>Unfit environment</i>	9	19
<i>Total</i>	47	100

Source: primary data 2022

According to the findings, plastic wastes are dangerous and have a negative impact to the environment, basing on the questionnaires from the respondents, 41.6% responded that plastic wastes lead to reduction in soil fertility, 17% poor soil aeration, 21% low water infiltration and 19% agreed that plastic wastes lead to unfit environment if they are lit red any haphazardly.

Table 2 showing the alternatives of plastics

Alternatives	No of respondents	Percentage
Jute bags	15	31.9
Paper bags	17	36.1
Bio degradable/reusable	15	31.9

Source: field research 2022

From the findings from table 2 and the figure above, it is seen the respondents agreed that jute bags, paper bags and degradable or reusable bags can work best for inform of plastic because they have less harm to the environment.

Inferential findings on regression

To establish the relationship between plastic waste and environment, the researcher carried out linear regression test. The results are presented in the tables below;

Table 3: Model summary for plastic waste and environment.

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.712	.507	.503	.27449
a. Predictors: (Constant), plastic waste				

Source; Primary data, 2022

Keeping others constant, a one percent increase in plastic waste would on average lead to 0.712 increase in Customer behavior in UBL. The R-squared value (0.507) is greater than the adjusted R-squared value (0.503) because it takes into consideration the degrees of freedom

Table 4: ANOVA values for plastic waste and environment

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	8.607	1	8.607	114.231	.000 ^b
	Residual	8.363	111	.075		
	Total	16.970	112			
a. Dependent Variable: environment						
b. Predictors: (Constant), plastic waste						

Source; Primary Data, 2022

The analysis's results, which are displayed in the above table, demonstrate that the regression model accurately predicts the dependent variable. The statistical significance of the regression model is indicated by $F=114.231$ and $P=0.000$, both less than 0.05. More proof for this comes from the difference between the regression's mean square value, which was 8.607 initially, and the remainder's mean square value, which was 0.075. This illustrates how plastic trash and the environment are related.

Conclusion

Conclusively, the research study analysed the findings and concluded that plastics need proper management because they are harmful to the environment and need urgent attention.

Recommendations

It is recommended that there should be sensitization of the general population on proper waste management and the effects of plastic wastes to the environment. Alternatives and non-harm full bags should be used in place of plastics which are less harmful to the environment.

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