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PERCEIVED INFLUENCE OF DRAINAGE AND WATERWAYS DUMPING ON THE ENVIRONMENT AMONG THE PEOPLE OF ILORIN SOUTH LOCAL GOVERNMENT AREA

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Abstract

The study examined perceived influence of drainage and waterways dumping on the environment in Ilorin South Local Government. It examined the influence of drainage and waterways dumping on flooding, erosion and environmental degradation.

Descriptive research design was employed for the study. The population of the study comprise of all the people in Ilorin South Local Government Area of Kwara State. A sample of 400 residents were selected using purposive sampling technique. A researcher developed questionnaire titled "Questionnaire on Influence of Drainage and Waterways Disposal on the Environment" (QIDWDE) was used. The questionnaire was validated by five experts in the related field. The reliability of the questionnaire was tested using Spearman Brown Rank Order which yielded a correlation coefficient of 0.78r. Three hypotheses were tested at .05 alpha level of significance. Inferential statistics of chi-square was used to test the data collected for the study.

The findings revealed that:

- 1. blocked drainage channels as a result of improper dumping of refuse in*

drainages and water channels can cause flooding [Calc. r -value = $0.428 \geq \text{Crit. } r$ -value = 0.197];

- 2. dumping of wastes in drainages and waterways blocks waterways and roads thereby facilitating higher rates of erosion by smothering natural vegetation cover [Calc. r -value= $0.531 \geq \text{Crit. } r$ -value= 0.197]; and*
- 3. improper disposal and management of waste is one of the causes of environmental degradation in many cities [Calc. r -value= $0.631 \geq \text{Crit. } r$ -value= 0.197].*

It was concluded that dumping of wastes in drainages and waterways significantly led to the incidence of flooding, erosion and environmental degradation in Ilorin South Local Government Area. It was recommended that the people of Ilorin South Local Government Area should avoid dumping of wastes in drainages to prevent or reduce the rate of flooding, improper disposal of refuse should be controlled and monitored to forestall the occurrence of erosion in Ilorin South Local Government Area and residents of Ilorin South Local Government Area should be encouraged to dispose their wastes in the proper way to prevent the degradation of their environment.

Key words: flooding, erosion, waterways, dumping, environmental degradation

Introduction

The generation of wastes is an inevitable issue in any household or society but the ways in which such wastes are improperly disposed have their effects on the health of individuals and that of the environment. Drainage and waterways dumping according to the researchers in this study refers to the dumping of waste in drainages (gutters) and pathways for flowing water which is illegal and unhealthy. The United States Environmental Protection Agency EPA(1998)defined illegal dumping as the disposal of waste in unpermitted areas, such as an open parcel of land, along stream banks, or at some other off-road areas. Pouring liquid wastes or disposing of trash down storm drains can also qualify as illegal dumping. It is often called "open dumping," "fly dumping," and "midnight dumping" because the waste materials are often dumped in open area from vehicles along roadsides late at night. Primarily, non-hazardous materials, illegally dumped wastes are dumped to avoid paying disposal fees or expending the time and effort required for proper disposal (EPA, 1998).

Babayemi and Dauda, (2009) postulated that in Nigeria, wastes are usually dumped on roadsides, available open pits, flowing gully water and drainage

channels. Flooding usually occur when watercourses such as gutters and storm drains cannot convey excess water from rainfall due to the fact that such watercourses have been blocked either by solid wastes or sand. Abiodun and Akinola (2014) posited that flooding, erosion, water pollution, drainage blockage, environmental degradation and land pollution is a result of illegal dumping of wastes generated in our environment into river courses which has led to a number of waste accumulation along the river courses and drainages. Ochuko (2014) reported that blocked drainage channels as result of improper dumping of refuse can cause flooding. Folorunso and Awosika (2001) and Ochuko(2014) linked flooding in Lagos State of Nigeria to the dumping of wastes in drainages which clog drainage channels.

Townsville City Council (2010) posited that littering, drainage dumping, waterways dumping and other forms of illegal dumping has the potential to cause health and safety risks for both people and the natural environment. Some of the effects outlined includes the blockage of waterways and stormwater drains, increasing the potential for flooding and erosion; attraction for further dumping; decreases community pride among others.

The United Nations Environment Programme (UNEP, n.d.) opined that the improper disposal and management of waste is one of the causes of environmental degradation in many cities, most especially in developing countries. Dumping of wastes in rainwater degrades an environment and does not attract tourists to such environments.

Department of Environment and Heritage Protection, (2015) reported that various forms of illegal dumping which drainage and waterways dumping is not an exemption has serious environmental and social impacts. Some of the effects of this form of waste disposal on the environment includes blocking of waterways and roads thereby causing flooding and facilitating higher rates of erosion by smothering natural vegetation cover. Aminu (2015) reported that lack of awareness on waste management, disposal method, collection, separation and technical expertise in the area of his study (Jigawa, Nigeria) was responsible for the various environmental problems being experienced which include gully erosion and flooding.

Statement of the problem

The researchers observed that some people take advantage of flowing water as a means of getting rid of their wastes. It was also observed that when there is a change in weather and it is about to rain, people get their wastes ready for dumping into the rainwater. Many tragedies have been recorded by flooding due to careless dumping of waste in water all over Nigeria. Many tragedies have been recorded by flooding due to careless dumping of waste in water, an example is the Ogunpa

River that had caused flooding several times. One of the recent Ogunpa flood was recorded between 28th and 29th August, 2011 after the river overflowed its banks once again following a torrential rainfall which uprooted cemeteries, damaged houses, destroyed bridges and made several roads impassable. As at the last count, no fewer than 50 people were unaccounted for while several families are still counting their losses both in human and material terms (This Day Live, 2011). Another example is the flood incident that was recorded on the 31st of September 2014 in Ilorin following the rain that started around 2a.m. Different places in Ilorin metropolis suffered the misfortune of flooding where collection of drainage water streamed into residential buildings, rivers overflowed their banks into homes, fences of different houses collapsed among others (Adekunle, 2015). A lot of property were lost due to this unfortunate incidence which could have been prevented by proper waste disposal.

Many People in Ilorin South Local Government Area lack the culture of waste disposal hence, they are in the habit of dumping their waste carelessly everywhere. Some people gather their solid waste together once they have premonition of rainfall, with the intention of dropping their wastes off in surface run-offs caused by the rain water. The intention of such people is for the rain water to carry off their solid refuse as far away from their houses as possible, not caring where such wastes end. Most of these wastes end up in water channels, inside drainages, on the roads or block sewages. The researchers observed that when it rains, the roads in various places in Ilorin metropolis is flooded and it makes it difficult for vehicles to move on the roads causing a serious hold-up on the roads. At times, the flood could be so serious as to carry cars that are parked from where they are parked and moved to another place. When rain subsides, the environment is mostly littered with dirt lying all around which is an eyesore to the environment and it degrades the environment. It is due to all these reasons that the researchers deem it fit to carry out this study.

Research Hypotheses

The following research hypotheses were formulated to guide the study;

1. drainage and waterways dumping will have no significant influence on flooding in Ilorin South Local Government Area.
2. drainage and waterways dumping will have no significant influence on erosion in Ilorin South Local Government Area.
3. drainage and waterways dumping will have no significant influence on environmental degradation in Ilorin South Local Government Area.

Purpose of the study

The purpose of this study is to;

1. find out if disposal of wastes in drainages and waterways will have any significant influence on flooding in Ilorin South Local Government.
2. ascertain whether dumping of wastes in drainages and waterways as a waste disposal strategy will have any significant influence on erosion in Ilorin South Local Government.
3. ascertain whether drainage and waterways dumping as a waste disposal strategy will have any significant influence on environmental degradation in Ilorin South Local Government.

Methodology

Descriptive research of the survey type was used for the study. The study population comprise all the people of Ilorin South Local Government Area. According to the National Population Commission Census (2006), the population of Ilorin South Local Government Area is 209,251. According to the Research Advisor (2006), for a population of 10,000 and above a sample of 380 is sufficient enough to represent the entire population at a level of confidence of 95% and a margin of error of 5% which is 2.66%. Therefore, a sample of 400 respondents was selected for the study.

Purposive sampling technique was used to select places with visible features of drainage dumping, blocked drainage and waterways, erosion and degraded environment by going round the study area and documenting places with such features. Simple random sampling technique of fish bowl method was used to select 50% of the documented areas. Purposive sampling technique was used to select shops and house owners around the selected places. A validated questionnaire from related experts was used to collect data from the respondents. The instrument was subjected to a reliability test using Spearman Brown Rank Order which yielded a correlation coefficient of 0.78r. The completed questionnaires were collected, sorted, coded and analyzed using the inferential statistics of chi-square (χ^2) at 0.05 alpha level.

Results

H₀₁: Drainage and waterways dumping will have no significant influence on flooding in Ilorin South Local Government Area, Kwara State.

Table 1: Chi-square analysis investigating the influence of drainage and waterways dumping on flooding in Ilorin South Local Government Area, Kwara State.

S/N	Items	S A	A	D	S D	Calcu- lated chi square	df	Criti- cal value	Deci- sion
1	Dumping of wastes in drainages block water ways which cause flooding	19 3	12 4	7 2	1 1				
2	When solid wastes are dumped in gutters, they do not allow rain water to flow properly which could lead to flooding	14 7	16 6	6 8	1 9				
3	Solid wastes in drainages help to hold more wastes that maybe flowing from other places which can cause flooding	13 2	17 6	7 4	1 8	236.9	9	16.92	Re- jected
4.	Water running downhill into channels and streams can cause flooding if such channels have been blocked by solid wastes	13 3	16 5	8 2	2 0				

From the table above, it can be observed that the calculated chi-square value of 236.9 is greater than the critical value of 16.92 with a degree of freedom of 9 at 0.05 alpha level of significance. Therefore the null hypothesis that says that drainage and waterways dumping will have no significant influence on flooding in Ilorin South Local Government Area was rejected. This implies that poor drainage management and waterways dumping contributes to the incidence of flooding in Ilorin South Local Government Area of Kwara State.

H₀2: Drainage and waterways dumping will have no significant influence on erosion in Ilorin South Local Government Area, Kwara State.

Table 2: Chi-square analysis investigating the influence of drainage and waterways dumping on erosion in Ilorin South Local Government Area, Kwara State.

S/ N	Items	SA	A	D	SD	Calcu- lated chi square	df	Criti- cal value	Deci- sion
1	When wastes are dumped into water channels and the water channel is blocked, the overflowing water from the drainages causes erosion	193	124	52	31				
2	Blocked drainages by solid wastes allow rainwater to smother the vegetative cover of the soil thereby leading to erosion	147	166	58	29		9	16.92	Re- jected
3	The rate of erosion is higher when drainages are clogged	132	176	64	28	236.9			
4.	Erosion caused by overflowing water from drainages can cause leaching of soil nutrients	133	165	62	40				

The table above revealed that the calculated chi square value of 236.9 at a degree of freedom of 9 is greater than the critical value of 16.92 at .05 alpha level of significance. Therefore the null hypothesis which states that drainage and waterways dumping will have no significant influence on erosion in Ilorin South Local Government Area was rejected. This implies that the blockage of drainage and waterways which affect the free flow of waste water and run off water from rain contributes to the incidence of erosion in Ilorin South Local Government Area of Kwara State.

H_03 : Drainage and waterways dumping will have no significant influence on environmental degradation in Ilorin South Local Government Area, Kwara State.

Table 3: Chi-square analysis investigating the influence of drainage and waterways dumping on environmental degradation in Ilorin South Local Government Area, Kwara State.

S/N	Items	SA	A	D	SD	Calculated chi square	Df	Critical value	Decision
1	Littering of solid wastes in an environment can lead to environmental degradation	193	124	52	31				
2	Dumping of wastes in drainages reduces the environmental pride of a particular place	147	166	58	29				
3	Dumping of wastes in drainages and waterways constitute a huge mess to the environment	132	176	64	28	236.9	9	16.92	Rejected
4.	Drainage dumping reduces aesthetic value of the environment	133	165	62	40				

The table above revealed that the calculated chi square value of 236.9 at a degree of freedom of 9 is greater than the critical value of 16.92 at .05 alpha level of significance. Therefore the null hypothesis which states that drainage and waterways dumping will have no significant influence on infrastructural degradation in Ilorin South Local Government Area was rejected. This implies that drainage and waterways dropping contributes to the degradation on the environment in Ilorin South Local Government Area of Kwara State.

Discussion of Findings

Hypothesis one which stated that drainage and waterways dumping will have no significant influence on flooding in Ilorin South Local Government Area was rejected because the calculated chi-square value was greater than the critical value. This implies that poor drainage management and waterways dumping contributes to the incidence of flooding in Ilorin South Local Government Area of Kwara State. This finding is in line with Ochuko (2014) who reported that blocked drainage channels as a result of improper dumping of refuse can cause flooding. This finding also corroborates the findings of Adetunji and Oyeleye (2013) which stated that indiscriminate dumping of waste which leads to the blockage of drainages and waterways contributes to the incidence of flood. The result of Abolade, Muili, and Ikotun (2013) which states that the non-functionality of drainages system influence the incidence of flood also corroborates this finding.

Hypothesis two which stated that drainage and waterways dumping will have no significant influence on erosion in Ilorin South Local Government Area was rejected because the calculated chi-square value is greater than the critical value. This implies that the blockage of drainage and waterways which affect the free flow of waste water and run off water from rain contributes to the incidence of erosion in Ilorin South Local Government Area of Kwara State. This finding is in line with Department of Environment and Heritage Protection, (2015) who reported that dumping of wastes in drainages and waterways blocks waterways and roads thereby facilitating higher rates of erosion by smothering natural vegetation cover. This finding is also in line with the findings of Ojo and Johnson (2010) which stated that the menace of erosion is a result of poor or blocked drainage system.

Hypothesis three which stated that drainage and waterways dumping will have no significant influence on environmental degradation in Ilorin South Local Government Area was rejected because the calculated chi-square value is greater than the critical value. This implies that drainage and waterways dumping contributes to the degradation of the environment in Ilorin South Local Government Area of Kwara State. This finding is in line with United Nations Environment Programme (UNEP, n.d.) who opined that the improper disposal and management of waste is one of the causes of environmental degradation in many cities, most especially in developing countries.

Conclusion

Based on the findings of the study, it was concluded that:

1. Poor drainage management and waterways dumping contributes to the incidence of flooding in Ilorin South Local Government Area of Kwara State.

2. Blockage of drainage and waterways which affect the free flow of waste water and run off water from rain contributes to the incidence of erosion in Ilorin South Local Government Area of Kwara State.
3. Drainage and waterways dumping contributes to the degradation of the environment in Ilorin South Local Government Area of Kwara State.

Recommendations

Based on the findings of this study the following recommendations were made:

1. The people of Ilorin South Local Government Area should avoid dumping of wastes in drainages to prevent or reduce the rate of flooding.
2. Improper disposal of refuse should be controlled and monitored to forestall the occurrence of erosion in Ilorin South Local Government Area.
3. Residents of Ilorin South Local Government Area should be encouraged to dispose their wastes in the proper way to prevent the degradation of their environment.

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