EFFECTS OF POOR DRAINAGE SYSTEM ON PERENNIAL FLOODING AND EROSION IN IJEBU ODE LOCAL GOVERNMENT, OGUN STATE

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Abstract

Ogun state and ijebu-ode in particular are facing extensive water logging during the rainy season as a result of serious problem of poor drainage. Inadequate drainage problem has become one of the most common source of concern for many residents and this is becoming worse every year. The study examined the effect of poor drainage system on perennial flooding and erosion in Ijebu-Ode local government are of Ogun state, Nigeria. Descriptive survey research design was adopted because the study did not involve manipulation of variables. Purposive sampling method was used to select a subject of the population while simple random technique was used to select 200 respondents for the study. The instrument used for data collection was a structured questionnaire while the research questions raised were analyzed with mean and standard deviation. The result found that there were serious effects of poor drainage system which causes flooding of streets and houses, destruction of properties and economic activities. Findings of the study also revealed that there was poor attitude of residents towards drainage system. Based on the findings, it was recommended among others that the inhabitants of Ijebu-Ode should be given proper education on waste management and waste disposal and that government should put in place flood early warning signal system.

Introduction

Poor drainage system form part of major threats to urban environment in Nigeria. Most of the streets within the urban and rural settlement are faced with the challenges such as lack of drainages or properly designed drainages to evacuate storm water from the surface-course- of our roads. Many people have been killed and their properties destroyed as a result of flood and erosion across the globe especially in the developing nations. As a matter of fact, flood and erosion hazard are natural environmental problems but the impacts are aggravated by consequences of urbanizations and human negative interaction with the environment without corresponding infrastructural restructuring or development.

Lack of drainage or poorly constructed drainage has become one of the most common sources of concern for many of residents of Ijebu-ode and this problem is becoming worse every year. Poor existing drainage and their improper operation and management mainly cause severe flooding which creates damages and problems to the road pavement and road users. It is against this background that this research intends to assess the effects of poor drainage system on perennial flooding and erosion in Ijebu-ode local government area of Ogun state.

Aderamo (2008) argued that despite the fact that urbanization is the dividing force for modernization, economic growth and development, there is increasing concern about the effect of expanding cities, principally on human health, livelihood and environment as a result of poor drainage. Drainage system are built in order to enable waste water, sewage and rain water to be moved to the disposal point without creating problem in the environment. Folorunsho and Awosika (2001) identified the components of good drainage system which include; closed ditches having pipe drains, drainage pipes, channels and conduits. Rokade, Agarwal and Shrivasta (2012) opined that the primary objective of drainage is to properly accommodate water flow along and across the road and conveniently transport and deposit the water to the downstream without any obstruction in the flow.

Markow (2016) identified certain factors as contributors to poor drainage system, these include poor design and construction, poor maintenance culture, negative attitude of residents, use of low quality materials. Flooding, which is one of the major environmental problems occur in most torrential portions of the world and it caused huge annual losses in terms of drainage and disruption to economic livelihoods business, infrastructure, services and public health. The menace of soil

erosion especially gully in no doubts represents a major ecological challenge facing most states and towns in Nigeria especially those in the humid tropical rain forest regions of Nigeria like Ijebu-Ode.

However, flooding in urban areas is not only limited to heavy rainfall and change in climate, but also associated with changes in built-up areas (Henderson, 2004). For instance, the problem of street flooding began in Ijebu-ode when some socio economic anthropogenic activities continue to increase in astronomically because of the reflux of people from both rural and feeder towns. Echendu (2020) studies the impact of flooding on Nigeria's sustainable development goals (SDGs). The work provides an overview of the relationship between flooding and sustainable development goals in Nigeria. The study discovered that one major cause of flooding is man-made. Adetunji and Oyeleye (2018) worked on assessment and control measures of flood risk in Ajibode area of Ibadan, in Oyo state and recommended appropriate strategies to reduce flood risk in the study area. Alejo (2018) carried out a research on assessment of poor drainage system in building within low land area in Akure metropolis. The findings reveal how the disposal of debris into the drainage have added adversely to the problem of flood in the study area. It also revealed that poor drainage system were actually the main cause of incessant flooding, destruction of environment infrastructural facilities, loss of lives and properties. Musa, Nda, Usman, Husaini, and Sanni (2014) worked on assessment of flooding vulnerability on physical development along drainage channels in Minna, Niger state, Nigeria. The result shows that human activities like construction on the flood plains, poor drainage system and relief of the area are primarily responsible for the perennial floods along the bank of the river Suka. It was recommended that sensitization campaigns should be embarked upon by the government. Soil erosion in Nigeria is a major environmental problem and according to Abdulfatai et al, (2014), Anijionu et al (2013), the effect/Impacts of soil erosion in Nigeria is summarized as follows;

- Reduced agricultural productivity and output/ yields due to degraded lands/soil
- Reduction of removal of plant nutrients and organic matter content of the soil resulting in elevated soil infertility
- Destruction of lives and properties

Objective of study

The general objective of this study is to assess the effect of poor drainage system on perennial flooding and erosion in Ijebu-ode, local government area of Ogun state. The specific objective of the study are to:

i. Examine the causes of flood in Ijebu-ode, Local Government
ii. Explore the effect of poor drainage system on the resident of the study area.
iii. Assess the attitudes of the residents towards drainage system, flooding and erosion system in the study area.

Research Questions

The following research questions were raised towards achieving the objective of the study.

i. What are the causes of floods in Ijebu-ode, local government?
ii. Are there effects of poor drainage system on the residents of the study area?
iii. What is the attitude of the residents towards drainage system, flooding and erosion in the study area?

Methods

Description survey research design was adopted because the study did not involve manipulation of any variable. The population of the study were residents of Ijebu-ode local government area of Ogun state. Purposive sampling method was used to select a subset of the population who actively affected by the flooding and erosion problem to respond to the questionnaire. 200 respondents were however randomly selected from the purposively selected area.

The instrument used for data was a structured questionnaire tagged questionnaire on effects of poor drainage system (QEPDS). The questionnaire was divided into two sections. Section A elicited information on demographic characteristics of the respondents and section B consisted of 20 items in form of questions that must be answered to achieve the objectives of the research. The instrument was structured based on a modified 4 points Likert scale of strongly agreed, agreed, strongly disagreed and disagreed.

The face and content validity of the instrument was established by experts in educational research, test and measurement. The comment, observation and corrections were used to effect necessary changes to the instrument before administering it to the respondents. The reliability of the

instrument was established through test, retest method. The questionnaire was given twice to another group different from the target population in Ijebu-ode local government in order to ensure the consistency of their responses. The two scores were then compared using Pearson product moment correlation (PPMC) to establish the reliability of the instrument. A coefficient of 0.8 at 0.05 level of confidence was considered reliable. The questionnaire was administered by the researcher with the aid of a research assistant to the respondents in their street and homes and was retrieved immediately to prevent loss and aid higher response rate. The data collected from the primary source in the study area was subjected to descriptive statistical tools for analysis such as frequency distribution table, percentages and charts for both the demographic characteristics and the relevant questions raised.

Results: Analysis of research questions

Table 1: showing the causes of floods in Ijebu-ode, local government area

S/N	Causes of Flooding	SA	A	D	SD	$\bar{x}$	Standard Deviation
1	Building of shops on water channels causes the majority of flooding in the area	17	58	50	75	8.4	1.59
2	Poor physical planning is the major cause of flood in the area	46	18	37	99	11.4	1.62
3	Inadequate drainage channel is the major cause of flooding in the area	70	75	55	0	8.4	1.59
4	Heavy rainfall is the major cause of flooding in the area	57	93	50	0	8.4	1.59
5	Indiscriminate dumping of refuse on drainage channels is a major cause of flooding	78	89	25	8	9.3	1.95

In the table above, mean score of 8.4, 11.4, 8.4 and 9.3 were all above the cutoff point of 2.50 which indicated that all the items were accepted by the respondents. The standard deviation of 1.5 to 1.9 shows a degree of closeness among the responses. The implication of this is that there are various causes of flooding in the area.

Table 2: Showing the effect of poor drainage system on the residents of the study area

S/N	Effect of Poor Drainage System	SA	A	D	SD	$\bar{x}$	Standard Deviation
1	Poor drainage system causes flooding of streets and houses	57	93	50	0	8.4	1.59
2	Poor drainage system causes landslide and erosion	78	89	25	6	9.3	1.95
3	Poor drainage system causes destruction of properties	70	75	55	0	8.4	1.59
4	Poor drainage system causes blockage of roads	89	110	1	0	11.4	1.62
5	Poor drainage system causes pollution	108	75	17	0	9.3	1.95
6	Poor drainage system causes pest and diseases	50	105	35	10	9.3	1.8
7	Poor drainage system causes disruption of economic activities	100	89	0	11	9.3	1.8

In Table 4 above, mean score of 8.4, 9.3, 8.4, 11.4, 9.3 and 9.3 were all above the cutoff point of 2.50 which shows that there were positive responses to the questions asked. The standard deviation of 1.59 to 1.95 shows a degree of closeness among the respondents. This indicates that there were serious effects of poor drainage system on the residents of the study area.

Table 3: showing the attitudes of residents towards drainage system, flooding and erosion in the study area.

S/N	Attitudes of The Residents Towards Drainage System	SA	A	D	SD	—	Standard Deviation
1	There is poor maintenance culture among residents towards drainage system	97	69	0	34	8.7	2.01
2	Collapsed damages are not repaired by residents	110	60	27	3	9.0	1.77
3	Weed and plants are allowed to grow in the drainages	101	99	0	0	8.4	1.59
4	Waste is usually dumped in the drainage	107	45	25	23	9.6	1.8
5	Drainages are left until they are fully destroyed	100	58	15	27	8.7	1.95
6	The community expect the government to maintain all the damages in their community	50	95	39	16	9.3	1.8
7	Residents of the area do not participate in providing solution to drainage problems such as blockages and leakages	58	133	4	5	8.4	1.59
8	Residents do not pay attention to maintenance of public facilities such as drainage system.	90	30	33	47	9.3	1.95

In table 5 above, mean score of 8.7, 9.0, 8.4, 9.6, 8.7, 9.3 and 8.4 were all above the cut off points of 2.50 which indicated that all the items were accepted by the respondents. The standard deviation of 1.5 to 1.95 shows a very close range among the responses. This indicates that there is a poor attitude of residents towards drainage system, flooding and erosion in the study area.

Discussion

The study indicates that poor physical planning, building of shops on water channels, heavy rainfall, inadequate drainage channel, indiscriminate dumping of refuse are factors responsible for flood and erosion occurrence in Ijebu-Ode. This finding is in line with findings of Ogba and Utang (2008) who examined the problems of flood in the Niger Delta and reported that the increasing built-up areas without proper recourse to urban planning rules and additional correction, could have accelerated infiltration of excess over-land flow. This finding also agreed with (Hualou,2011) who found that

food disaster result from human-created vulnerability which is an outcome of human interacting with the environment by some activities such as designing and locating infrastructure, exploiting natural resources, overpopulation and so on.

The study also found that there were serious effects of poor drainage system on the residents as poor drainage system causes flooding of streets and houses, destruction of properties, erosion and destruction of economic activities in Ijebu-ode. This correlates with the findings of Alejo (2018) who carried out a research on assessment of poor drainage system in building within lowland area in Akure metropolis. His findings revealed that the disposal of debris into drainage have added adversely to the problem of flood in the study area. It also revealed that poor drainage system were actually the main cause of incessant flooding, destruction of environment, infrastructural facilities, loss of lives and properties in the study area. This finding also corroborate that of Owuama, Uja, &Kingsley,(2014) who found that flooding can lead to the formation of stagnant pools and result in breeding sites for disease vectors such as mosquitoes, increasing the risk of malaria, and other diseases.

Finally findings revealed that there was poor attitude of residents towards drainage system. This was connected to poor maintenance and other factors. This findings supported that of Agbonkhese, Yisa and Daudu (2013) who studied bad drainage and its effect on road pavement conditions in Nigeria and came up with some reasons as to why there is poor or bad road conditions relating to drainage. Their research stressed that poor maintenance of, poorly executed construction jobs, negative attitude of residents, and noncompliance to existing master plan of town has been the cause of poor road conditions. They concluded that poor drainage has led to fast deterioration of most roads in Nigeria.

Conclusion

Flood and erosion are major environmental problems affecting the inhabitants of Ijebu-Ode. The yearly flooding and erosion can be attributed to negative interaction of people with the environment such as building houses and shops across the flow of water, improper dumping of refuse or waste, poor physical planning and so on. As a result of this menace, many properties and lives had been lost. The findings of this study was to assess the drainage system and flood occurrence in ijebu ode, the data collected from the field and extant literatures were used to achieve the outlined objectives, the result revealed that flood occurs every year in most parts of the season. On the dimension of the

drainages across the sampled areas, only few areas had consistent pattern of drainage width and runoff. That is, high drainage width correlated positively with runoff volume. However, many areas showed irregular pattern in drainage width and runoff volume. The presence of waste and other household items like plastic bottles in the gutters might have been responsible for the storm water overflowing it bounds. This also has created series of environmental and socio-economic problems in Ijebu-Ode. Some of which include flooding of street, pollution of domestic water sources, distortion of the beauty of the environment among others.

Recommendation

In view of these, the study put forward some recommendations which when implemented will help in mitigating flood occurrence in Ijebu-Ode.

The inhabitants of Ijebu-Ode should be given proper education on waste management and how to favorable dispose the waste. Government should put in place flood early warning signal system with the capability to deliver reliable timely and effective flood information at an appropriate time. The government and NGOs should carry out massive awareness campaigns on the need for the people to stop dumping waste in the drainage channels. The government of Ogun state should take proactive measure to mitigating the storm waters by clearing the drainage channel on regular basis. The government contract should be awarded to a competent company for the construction of underground drainages covering the entire Ijebu ode, as surface drainages have created many problems to the resident including loss of lives. Proper penalty should be meted out to people who dispose waste in drainages, likewise, those who refuse to engage in monthly sanitary exercise should be punished.

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