

The Impacts of Poor Maintenance of Drainage System in Damaturu Town, Yobe State Nigeria

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Abstract

The study was formulated to investigate the impact of poor maintenance of drainage system in Damaturu town, Yobe state. The materials used for data collection include mainly the questionnaire administration, direct observation, and facility survey. The result indicates that dumping of refuse in water channels is the major cause of poor maintenance of drainage system in the area. The finding further revealed that poor maintenance of drainage system lead to distortion of aesthetic environment; it also lead to excess of soil erosion, and destruction of infrastructural facilities such as road, and houses. It is common to see flooded streets with litter floating everywhere after a short period of rainfall. Such situations create very unsanitary conditions for residents of the neighborhoods and contribute to the degradation of the environment.

Introduction

Environmental disasters have become common phenomenon in the world, (Oyegbile, 2008). The basic underlying purpose of any drainage system is to

keep people from water, to keep water from the people and to protect and enhance the environment. (Thomas and Dedo, 2002). During the rains, part of the rain water flows on surface and part of it percolates through the soil mass as gravitational water until it reaches to the ground water. Drainage System is part of city infrastructure and they are an important key in urban life. If the drainage falls, cities become subjected to floods, to possible environmental degradation, to sanitation and health problems and to city services disruption. On the other hand, urban rivers, in different movements of cities development history, have been considered as important sources to water supply, as possible defenses for urban areas, as a way of transporting goods, and as means of waste conveying storm drainage (kolsky, 1998).

Sustainable drainage system is a sequence of management practices, control structures and strategies designed to efficiently and sustainably drain surface water, while minimizing Pollution and managing the impact on water quality of local water bodies. Sustainable drainage system is increasingly used to mitigate excessive flows from storm water and reduce the potential for pollution from run-offs in urban areas. Sustainable drainage systems are often designed to replicate as closely as possible the natural drainage prior to any development (Olukanni, D. O. and Akinyinka, M. O. 2012). This may include infiltration devices to help reduce pollution contained in the surface water run-off. Sustainable drainage system removes water quickly and efficiently in a sustainable manner and should be included in the master planning of housing developments wherever possible. The adoption and success of sustainable drainage system will depend on the local ground conditions (primarily type of soil) and groundwater tables in the area Debusk, and Hunt, (2014)

For a long time, urban drainage systems have existed as a vital city infrastructure to collect and convey storm water and wastewater away from urban areas. At the same time, water quality problems also emerge as a result of urbanization that increases the variety and amount of pollutants and nutrients in receiving water bodies. Floods are natural and seasonal phenomena, which play an important role, but when they take place at the built environments, many losses of different kinds occur. By its side, urban growth is one of the main causes of urban floods aggravation. Changes in land use occupation, with vegetation removal and increasing of impervious rates lead to greater run-off volumes flowing. Intense urbanization is a relatively recent process; however,

floods and drainage concerns are related to city development since ancient times Gomez-Ullate, E, Bayon, J.R Coupe, S. and Castro-Fresno, D. (2010).

Methodology

Study Area

Damaturu is the state capital and the center of administration of Yobe State it's experiencing a rapid growth. The growth starts since its creation in 1991 due to the movement of people especially civil servants. Migration of people from the rural areas to the new state capital in search of employment and a better standard of living also influences the growth. These are the major factors that lead to the economic growth of the city, hence the unplanned growth and lack of monitoring. Slums were developed; agricultural lands are continuously converted to urban development.

Damaturu rose from the capital of a local government to the status of a state capital in 1991 (Babalola A., et al,) which brought about the rapid growth of the population from about 10,000 before it become the state capital in 1991 to nearly 88,000 in 2006 and in (2010) the population raised to 95,000 people. The increase in the population is responsible for the rapid urbanisation and economic growth of the town thus the, the need for effective and efficient drainage system; rise in the standard of living of the people (Babalola A, 2012). Study is a descriptive survey design aimed at identifying the impacts of poor maintenance of drainage system. Ali (2006) stated that a survey is a descriptive study which seeks or uses the sample data of an investigation to document, describe, and explain what is existent or nonexistent, on the present status of a phenomenon being investigated. Ali went further to say that in surveys, views, facts etc are collected, analyzed and used for answering research question. Simple random sampling was used in selecting two hundred (200) Respondents from the study area. The materials used for data collection include mainly the questionnaire administration, direct observation, and facility survey. The instrument used for collection of the relevant data to answer the research questions was a 16-item structured questionnaire titled "impacts of poor maintenance of drainage system in Damaturu town, Yobe state Nigeria" (IPMDS). The instrument which develops by the researcher has a four-point likert type scale. The four point likert scale was used to accommodate all the research questions in the questionnaire, as shown: Strongly Agree (4 Points), Agree (3 Points), Disagree (2 Points), Strongly Disagree (1 Point). Data collected was analyzed using mean

scores, and frequency table. The findings of the study will have implication for counselling in all areas within the town.

Table 4.1 Factors responsible for poor maintenances of drainage system

S/N	ITEMS	SA	A	D	SD	MEAN	S.D
1	Dumping of refuse in water channels	104 52%	66 33%	21 10.5%	9 4.5%	3.325	.838
2	Improper waste management	49 24.5%	87 43.5%	32 16%	32 16%	2.765	.0997
3	Blocking water channels	67 33.5%	93 46.5%	31 15.5%	9 4.5%	3.090	.819
4	Present of stagnant water in the area	41 20.5%	66 33%	65 32.3%	28 14%	2.600	.967
5	Improper sanitation by the resident	49 24.5%	87 43.5%	32 16%	32 16%	2.765	.0997
6	Poor monitoring and evaluation of site for construction	61 30.5%	52 26%	38 19%	49 24.5%	2.395	1.056
7	The drainage systems are not wide enough in the study area.	67 33.5%	93 46.5%	31 15.5%	9 4.5%	3.090	.819
8	Inadequate of maintenance by the government and individual	69 34.5%	60 30%	25 12.5%	46 23%	2.320	.966
9	Government negligence	72 36%	66 33%	33 16.5%	29 14.5%	2.400	1.125
10	Lack of public awareness by the government institutions on drainage management	74 37%	75 37.5%	37 18.5%	14 7%	3.045	.915

Source: field of survey, 2019

Table 4.1 shows the analysis of the result on factors responsible for poor maintenance of drainage system. It can be seen that 85% of the respondents agreed that dumping of refuse in water channels/ drainage is responsible for poor drainage maintenance in the area. The table also reveals that 69% of the respondents agreed that improper waste management is responsible for poor drainage maintenance in the area. It can also be seen from the table that 56.5% of the respondents agreed poor monitoring and evaluation of site for construction is responsible for poor maintenance of drainage system. The result further revealed that 69% of the respondents agreed that government negligence

is also responsible for poor maintenance of drainage system in the town. It can also be seen from the table that 74.5% of the respondents agreed Lack of public awareness by the government institutions on drainage management construction is responsible for poor maintenance of drainage system..

Table 4.2 Effects of poor maintenance of drainage system

S/N	ITEMS	SA	A	D	SD	MEAN	S.D
1	It may lead to flooding of Houses	76 38%	74 37%	36 18%	14 7%	3.06	.917
2	Destruction of infrastructural facilities such as road, and houses.	64 32%	65 32.5%	53 26.5%	18 9%	2.875	.966
3	It may lead to occurrence of diseases such as malaria and cholera out break	75 37.5%	71 35.5%	31 15.5%	23 11.5%	2.990	.997
4	It can lead to distortion of Aesthetic environment	82 41%	72 36%	25 12.5%	21 10.5%	3.075	.977
5	It can lead to deposition of debris into the road and houses	59 29.5%	53 26.5%	48 24%	40 20%	2.655	1.105
6	It lead to excess of soil Erosion	72 36%	53 26.5%	52 26%	22 11.5%	2.670	.988

Source: field of survey, 2019

Table 4.2 shows the analysis of the result on effect of poor maintenance of drainage system. It can be seen that 75% of the respondents agreed that poor maintenance of drainage system leads to flooding of houses. The table also reveals that 64.5% of the respondents agreed that poor maintenance of drainage system leads to destruction of infrastructural facilities such as road, and houses. It can also be seen from the table that 73% of the respondents agreed that poor maintenance of drainage system lead to occurrence of diseases such as malaria and cholera outbreak. The result further revealed that 77% of the respondents agreed that poor maintenance of drainage system can lead to distortion of Aesthetic environment. The analysis also shows that 73% of the respondents agreed that poor maintenance of drainage system lead to excess of soil erosion.

DISCUSSION OF THE FINDING

The basic underlying purpose of any drainage system is to keep people from water, to keep water from the people and to protect and enhance the environment, (Thomas and Dedo, 2002). Lack of proper waste management;

(lack of adequate waste collection and disposal system cause poor sanitation as it leads to the blockage of drainage. Table above shows that dumping of refuse in water channels is the major cause/ factors responsible for poor maintenance of drainage system in the area, even though the drainage system is not adequate in some areas in the study area. In areas where drainage and sanitation are poor, water runs over the ground during rainstorms, picks up faeces and contaminates water sources. This contributes significantly to the spread of diseases such as typhoid and cholera, and may increase the likelihood of contracting worm infections from soil contaminated by faeces. Flooding itself may displace populations and lead to further health problems. The construction of drainages will be a waste when not properly maintained. The performance of drainage is attributed not only to how effective it is utilized, but also to the conditions there in; these conditions include the presence of waste, the presence of growing plants and leakages. These changes do not only retard flow in the drainage, but they also increase over flow conditions, it was clear that problem of poor performance of drainage system within these areas were as a result of poor maintenance of the drainage themselves, and their non-availability in some area. The table further shows the effect of poor maintenance of drainage in the area. The findings revealed that there is no significance difference in the level of education of the respondent in terms of dumping waste in the drainage system available in the sampled area; which indicates that the level of education of people couldn't stop them from dumping their domestic waste in the drainage in front of their houses.

One of the main obstruction preventing the successful control of storm run-off measures and promoting good drainage system either by structural or non-structural measure is the absence of community participation in providing solution to urban drainage problems. Community participation simply depends on the desire and ability to organize them, to participate in removing some waste in the drainage and stopping public from dumping refuse in to the drainage as the table above shows ways in which residents participate in removing waste/ reducing drainage problems in the area.

Silveira et al, (2001) identified the biggest difficulty in community participation which is the wide difference in socio-economic level amongst those living in the city; poor people living in areas with run-down public services inherently pay little attention to public utilities. It is not new anymore as people regard urban drainages as the place to dispose garbage. However, environmental

education programs are necessary but not adequate in eradicating urban drainage problems.

It is often essential that community members participate in maintaining drainage; in Damaturu, for example, residents do not agreed to clean the drainage in front of their houses every week and even every end of the month. Flood related issues are experienced majorly during the raining seasons in the area, but they are very pronounced owing to poor sanitized environment during and after the raining seasons. It has been concluded that poor drainage system has many devastating effect on the socio-economic and the livelihood of the community; reducing productivity of community, it also lead to sicknesses such as malaria fever due to breeding of mosquitoes in stagnant water around poorly drained area.

It is common to see flooded streets with litter floating everywhere after a short period of rainfall. Such situations create very unsanitary conditions for residents of the neighborhoods and contribute to the degradation of the environment. Nigeria is currently experiencing its annual rainy season, and in order to avoid lethal floods it is important to have very effective maintenance of drainage systems and strive towards ensuring free flow of water during and after heavy downpours.

The finding further revealed that poor maintenance of drainage system lead to distortion of aesthetic environment; it lead to excess of soil erosion, and destruction of infrastructural facilities such as road, and houses.

CONCLUSION

The basic underlying purpose of any drainage system is to keep people from water, to keep water from the people and to protect and enhance the environment. Sustainable drainage system is a sequence of management practices, control structures and strategies designed to efficiently and sustainably drain surface water, while minimizing pollution and managing the impact on water quality of local water bodies. Lack of proper waste management; (lack of adequate waste collection and disposal system cause poor sanitation as it leads to the blockage of drainage.

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and may increase the likelihood of contracting worm infections from soil contaminated by faeces.

Finally, poorly maintained drainage systems and poor waste management habits can adversely affect our environment in the following ways;

- Flooding: The immediate effects of flooding include loss of human life, damage to property, destruction of crops and other plants, loss of livestock
- Erosion: The absence of good drainage systems can cause erosion problems. This has been experienced in many areas of Nigeria, where roads have been washed away and gullies created as a result of flooding.
- Diseases: Deterioration of health is another effect of flooding, due to the increase in waterborne diseases and unsanitary conditions. Stagnation of water occurs when water passages are blocked. This makes the people around such environments susceptible to infections from mosquitoes and other insects.

There is need for public awareness campaign on impacts of dumping domestic waste /refuse in drainage system. Also vegetation plants whose roots are likely to damage the drainage system should be removed and dumping of refuses into the drainage systems should be guided against.

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