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An evaluation of the physical planning flood control measures adopted in kubwa town, federal capital territory, Abuja

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ABSTRACT

Flood has today become a major disaster ravaging communities in different parts of the world, especially those lying around the banks of rivers. But most importantly, flooding occurs when the natural waterways are obstructed due to human quest for "development". However, Physical Planning Agencies as well as many communities are now becoming more aware of the need to embrace best environmental management practices in order to avert the recurring colossal damages of flooding. Therefore, this paper set out to evaluate the physical planning measures adopted in controlling flooding in Kubwa town of the Federal Capital Territory, Abuja. In order to achieve this, a direct interview session was held with the representative of the Development Control Department (DCD) of the Federal Capital Development Authority (FCDA) and also, a total of 100 questionnaires were administered on household heads or their representatives-representing 20% of the about 500 houses that were affected by the 2009 flooding. The primary data obtained was subsequently analysed using the descriptive statistical methods and the result revealed that the FCDA is to blame for granting legal titles for developers to build on the flood plain of river Usuma; this is because 60% of the houses submerged by the 2009 flooding have either C of Os or statutory right of occupancy. Owing to this therefore, the paper recommended that the FCDA should take a major step in addressing the situation through the enforcement of physical planning policies and the sensitization of the members of the public on how best to ensure a flood-free society by embracing environmental best practices.

Introduction

Many parts of the world are today grappling, more than ever, with the effects of flooding. This can basically be associated with human activities in the environment which has altered the earth's climate, thereby causing global warming and its associated effects; thus increasing the quantity of precipitation in many parts of the universe. Owing to this therefore, the devastating effects flooding on human lives, properties and the environment, has also been on the rise. Flooding, which occurs as a result of the inundation of the environment by excess water, was conceptualised as the accumulation of excess water that "occurs when soil and vegetation cannot absorb all the water; (which) then runs off the land in quantities that cannot be carried in stream channels or retained in natural ponds and constructed reservoirs". (Microsoft Encarta, 2009).

Flooding which is either caused as a result of natural or man-made phenomena, is usually trailed by its adverse effects which most a times, entail far-reaching socio-economic and environmental implications, that may include loss of lives and properties, mass migration of people and animals, environmental degradation, and shortages of basic human needs and services. Thus, in comparison with other natural disasters, flooding has the largest damage potential and as well affects a larger number of people. In view of this, according to Usman (2012) cited the United Nations (2004) as stating that flooding causes over one third of the total estimated costs of global disasters and also responsible for two-third of the people affected by natural disasters. Therefore, this paper was premised on the assessment of the risk factors and measures taken to checkmate the recurring flooding that visits Kubwa, a satellite town of the Federal Capital Territory, Abuja, annually.

Aim and Objectives

The aim of the paper is to evaluate the physical planning measures adopted in controlling flood in Kubwa town, Federal Capital Territory, Abuja. The specific objectives are to:

i. Assess the physical and environmental challenges causing flooding in Kubwa town;

ii. Examine the effects of flooding on structures and the environment and;

iii. Identify the flood control adopted in solving the problem of flooding in Kubwa.

Background information of the study area

Kubwa, one of the satellite towns of FCT Abuja, was originally a Gbagi settlement that had existed long before the designation of Abuja as the Federal Capital Territory. It is situated in Bwari Area Council and located on latitude 9^0 49"N and longitude 7^0 66"E, with an area of about 100km^2. The Gbagis are predominantly farmers and they grow crops like yams, cassava, groundnut and maize. Kubwa has a generally low topography, with dotted rock outcrops and a height range of 406m along the River valleys to 448.8m at the highest point.

River Usuma and its tributaries which provides potable water to the FCT, practically divides Kubwa town into sectors as

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they pass through it. Studies on the rainfall, run-off regime and stream flow characteristics of River Usuma basin had shown that the incidence of flood has been on the increase and that the land uses in Kubwa has had profound influence on its flood pattern. The town has an average temperature of about 32^{o}C and an annual rainfall of about 117 cm with the highest rainfall recorded within the months of July, August and September.

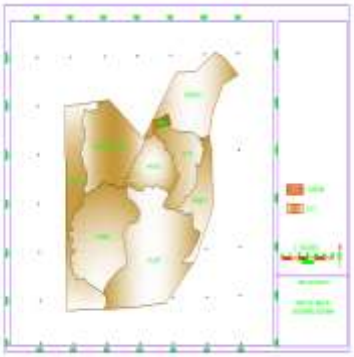

Fig 1.1: Area Councils of the FCT showing Kubwa settlement

Source: AGIS, Abuja

Research Methodology

This section deals with the approach and methodology used in the sourcing, collection and analysis of data for this paper. The research work was based on two types of data i.e., the primary and secondary data.

Population and Sampling Technique

In the year 2009, according to the Federal Capital Development Authority (FCDA), about 500 buildings lying within 45m of the Usuma river bank were affected by floods in Kubwa. Therefore, for the purpose of this paper, 20% of those houses were sampled i.e., a total of 100 questionnaires were administered using the simple random sampling technique. In this method, samples were selected using raffle draw, thus it ensured that every other member of the population had an equal chance of being selected.

Procedure for Data Collection

Primary Data

This study utilized the field observation, direct interview and the questionnaire methods of data collection in obtaining the primary data from the field. While the questionnaires were administered on household heads or their representatives, the direct interview was used in collecting relevant information from the Development Control Department (DCD) of FCDA.

Secondary Data

This source of data was employed to collect relevant information to the research work, and it was basically obtained from internet sources and textbooks.

Method of Data Analysis and Presentation

The data obtained from the field were analyzed using descriptive statistical methods i.e., bar charts.

Data Analysis

Types of Title held and Housing Ownership

It is generally believed that the type of title (whether legal or illegal) held by a developer is reflected not just in the structural stability of the building but also on the developers financial commitment to the project; thus striving to maintain and ensure the longevity of the building are of utmost importance to the developer. This is because possessing a legal title like the Certificate of Occupancy or Statutory Right of Occupancy entails that the developer's right is secured and thus would have acquired the necessary approval prior to the construction of the housing unit from the appropriate physical planning organisation. Owing to this therefore, data on the type of rights and the ownership of the buildings were sought. The result showed that 60% of the sampled houses (i.e., 20% owner occupied and 40% rented) have C of Os, while 16% and 6% of the sampled houses that have Statutory Right of Occupancy are owner occupied and rented apartments respectively. This implies that majority of the developers acquired the necessary approval prior to the construction of their buildings, which thus make the buildings legal. Therefore, officials of the FCDA are to blame for granting legal titles and building approvals to developers in such areas, especially when it is glaring that they are lying around flood plain river Usuma. Also, the chart shows that majority of the owners of buildings within this area do not reside in them because they are aware of the dangers posed by flooding in those areas.

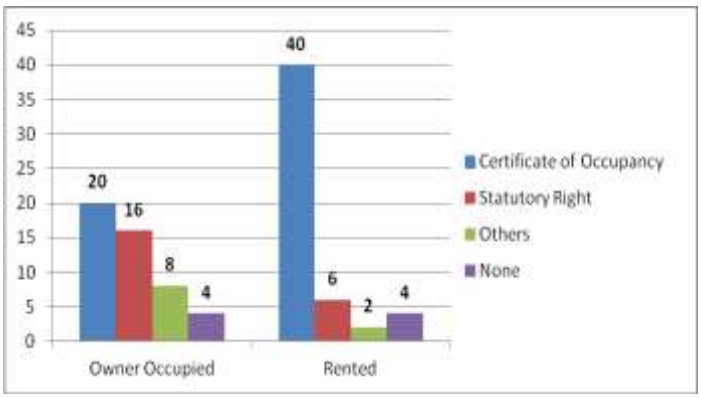

Fig 1.2: Types of Title held and Housing Ownership (%)

Physical and Environmental Challenges causing Flooding

Poor State of Drainages

The drainage network is a flood control measure that should be put in place by both the governments and individuals; this is because its presence helps in the collection, transportation and disposal of storm and waste water to the appropriate point. According to the result of the survey, 78% of the buildings in the study area have drainages while the remaining 22% of the houses in the study area did not have drainage. Despite the fact that most of the houses in the study area have drainages, Kubwa is still faced with the problem of flooding owing to the waste disposal practices of the residents and the poor quality and narrow sizes of the drainages constructed by developers.

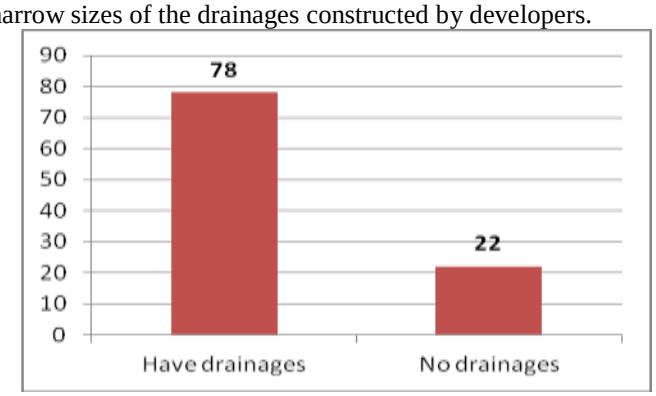

Fig. 1.3: Presence of Drainage (%)

Method of Solid Waste Disposal

Refuse disposal practices within the study area are by the use of refuse dumping sites, dump bin, and the dumping of waste in nearby bushes (which can easily be washed into the waterways). Solid waste is a major cause of blockage to storm and waste water flow and hence an understanding of its method

of disposal is very relevant. The sampled result on waste disposal practices revealed that 28% of the residents dispose their waste in refuse dumping sites, 48% of the sampled buildings make use of dump bins, and 24% of the houses dispose there refuse in the nearby bushes. Although a fewer number of the respondents said they dispose their refuse in nearby bushes, most of the houses that use the dump bin confirmed that they eventually empty their containers into the nearby bushes. This therefore implies that solid waste materials are major contributors to the blockage of water ways in the study area.

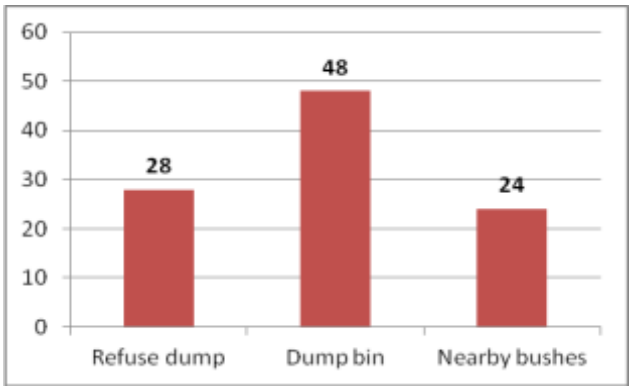

Fig. 1.4: Method of Solid Waste Disposal (%)

Factors of flooding

The opinions of the residents of the sampled neighbourhoods were sought as regards the immediate and remote causes of the perennial flooding ravaging the community. This was done in order to feel their pulse concerning some of the negative environmental activities they engage in. The result showed that 56% of the residents of Kubwa believe that excess rainfall is the cause of the flooding in the community, 14% of the respondent said it was poor drainage network, 22% of them stated that poor setback was the main cause of the flooding in the area.

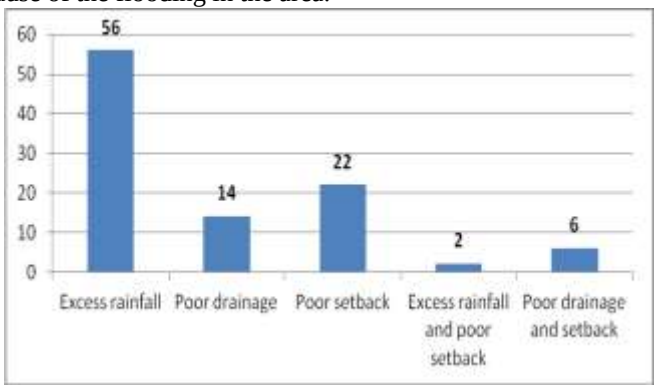

Fig 1.5: Factors of flooding (%)

Effects of Flooding on Structures and the Environment

The effects of flooding on landed properties are usually visible, especially when the buildings have been at one time or the other, submerged. Thus, data on the physical appearance of the buildings in Kubwa was sought and obtained in order to assess the extent of the effect of flooding on them. The result showed that 38% of the walls of the buildings are in good conditions, 56% of the walls are fair and 6% of the walls are in bad condition. This implies that majority of the buildings are fair but tending towards dilapidation which will in turn reduce the value and lifespan of the buildings. So also, the general environment is not spared from the effects of flooding; the most visible ones in Kubwa according to the respondents include erosion, disruption of traffic, submergence of farmlands, destruction animals, and disruption of public utilities and services

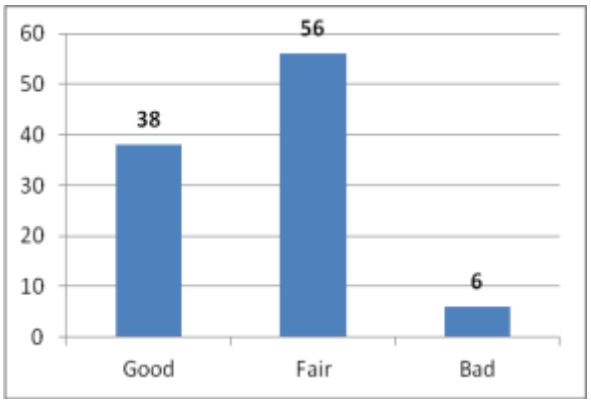

Fig. 1.6: Conditions of the Buildings (%)

Fig 1.7: Topographic Map of Kubwa

Source: NEMA GIS Unit

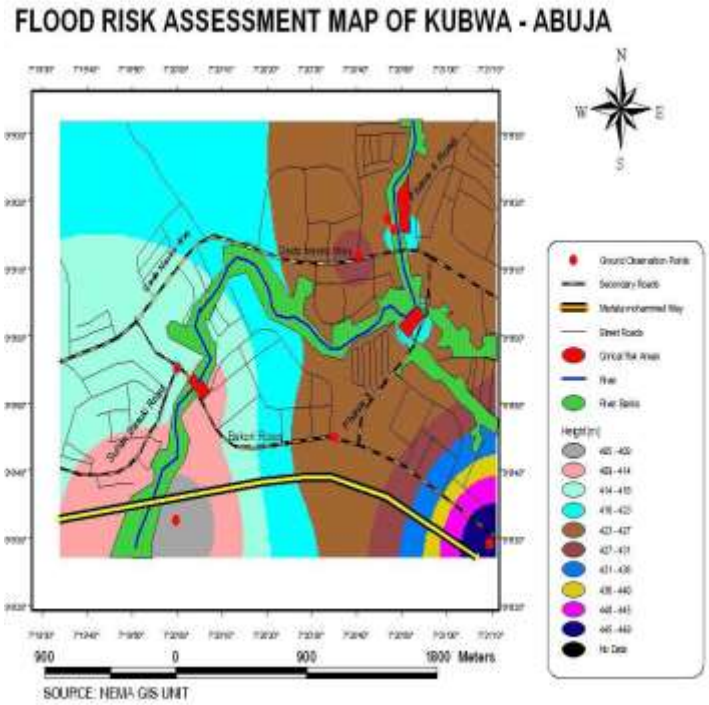

Fig 1.8: Flood Risk Assessment Map of Kubwa

Causes of Flooding and its Effects

As earlier stated, the official position of the DCD of FCTA was sought as regards the factors causing flooding as well as its effects in the study area. Thus, the following factors were adduced as responsible for flooding in Kubwa:

- Excess amount of rainfall which causes massive perennial flooding especially during the peak period of the rainy season;

- Blockage of the drainages with waste materials as a result of the poor refuse collection culture amongst the residence and;
- The non-compliance with planning regulations resulting in the erection of illegal structures on flood plains which causes the blockage of natural waterways.

Also, the following were highlighted by the DCD as the major effects of flooding in the study area:

- Destruction of properties and infrastructure worth millions of naira;
- Submergence of houses and farmlands;
- Grounding of economic activities in the study area and;
- Displacement of people and the depletion of livestock.

Plate III: a roadside drainage network over grown by weed

Plate IV: an obstructed canal causing the ponding of excess rain water

Plate V: an open drainage used as a refuse dump

Plate VI: an housing unit constructed just at the edge of a natural water way

Flood Control Methods adopted by the DCD

- The relocation and demolition of buildings built on flood plains;
- Extensive enlightenment campaigns in flood prone areas of the town and;
- The development of alternative means of curbing the effects of flood in Kubwa e.g. the opening up of water channels to allow for the free flow of water, clearing of the existing drainage system as well as sensitising the people on how to effectively dispose their waste.

Conclusion and recommendations

Conclusion

Records have, over the years, shown that Kubwa is vulnerable to flooding. Thus, the risk and fear faced by its residents are on the increase considering the fact that flooding is fast becoming a recurring decimal in many parts of the world. But despite the impending dangers faced by the residents of Kubwa, they are yet to appreciate and embrace environmental best practices needed to be put in place to avert flooding in the community. The present state of affairs needs to be arrested earlier; else it would pose a major challenge to the community in the near future. Therefore, the residents need to be informed on how best to ensure a flood-free community through the conveyance of town hall meetings of all the stakeholders in the community by the DCD.

Recommendations

1 The construction of buildings should be strictly monitored in order to conform with the building code;

2 Embankments should be created and river should be channelized to control and allow free flow of the river;

3 Enhancement of refuse disposal system in order to discourage indiscriminate refuse dumping;

4 Recertification of approval and building plans at interval to ensure compliance with building plans.

5 Adoption of non structural measures of flood control such as:

a) Public awareness on the danger posed by flooding to lives and properties and;

b) Early warning should be given to the people so they can prepare ahead for the flood.

Reference

Flood Control. (2009) Microsoft Encarta [DVD]. Redmond, WA: Microsoft Corporation.

Usman, I. (2012) A Survey Of The Area Vulnerable To Flood And The Mitigation Strategies Adopted By Akare Community, Niger State, Nigeria. An Unpublished M Sc Thesis submitted to the Centre for Disaster Risk Management and Development Studies, Federal University of Technology, Minna.