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Challenges and Prospects of Participatory Risk Disaster Reduction Approach: Examining Ala-River Flooding, Akure, Ondo State, Nigeria

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Abstract

In almost every part of the world, flood events are a part of nature, sometime floods are avoidable but most of the time not avoidable, due to its unpredictable occurrence, flood have existed and will continue to exist as long as the earth exist, but in most cases, the devastating effects is referred to as disaster, however, what is crucial, is human interference with nature, which in many cases aids the devastation of flood disaster. This paper reviewed challenges and prospects of participatory risk disaster reduction approach as one of the methods employed to reduced flood disaster risk, in relation to the situation of Ala River flooding in Akure. The paper critically examine some of these challenges which includes, flood risk, disaster management, where various issues relating to, vulnerability to flooding, economic status of residents, state of infrastructure among others were discussed. While on the other hand, some of the prospects examined in respect of this study include the issue of urban agriculture along the river path, which include planting of vegetables and rearing of fish ponds, also the issue of greening the river path to serve as absorber of urban pollutions, were all suggested as parts of the strategies that can reduce flood risk disaster and also disaster management techniques. Recommendations put forward were, establishment of coordinated development management strategy to cover the entire water logged area, extensive construction of drainages and canals to handle river flow, provision of coordinated waste management system and improvement of the economic status of the residents of the study area.

Keywords: Participatory Geographical Information System, Flood Risk, Disaster Management, Urban Agriculture

Introduction

Flooding is a major natural hazard is affecting some 520 million people every year, claiming the lives of about 25,000 worldwide and causing global economic losses between $50 and $60 Billion annually [1]. Therefore, it's essential to manage the risk of flooding in an effective and appropriate way. Human being is constantly facing both natural and man-made disaster of different types, but in most instances, disaster(s) occurs naturally but humans

are vulnerable to disasters because of human actions or inactions towards disasters, natural disaster such as floods are becoming more complex and climate change leads to a greater potential for adverse impacts [2]. As much as this assertion stands, natural disaster such as floods are often time than not being influenced or caused by human activities and complemented by climate change , because if actions have been taken earlier before the sudden adverse climatic conditions, the level of human vulnerability to climate change-prone disaster will have been reduced considerably.

Although it is observed that, natural disasters have its huge impacts at both at local and urban levels, but its impact is hugely felt in the urban centre than the countryside because of huge investment and population concentration in the urban centres. Internationally, floods are the leading cause of natural disaster deaths worldwide and responsible for 6.8 million death in the 20th century. Asia is the most flood-affected region accounting for nearly 50% of flood-related fatilities in the last quarter of the 20th century [3-5]. The Centre for Research on the Epidemiology of Disasters (CRED), defines a flood as a significant rise of water level in a stream, lake, reservoir or coastal region [6]. However, [7] emphasized that, in developing world, a very high proportion of urban population growth and spatial expansion takes place in dense, lower-quality informal settlement often referred to as “slum”. These are located in both city-centre and peripheral, suburban or peri-urban locations and are frequently at highest risk.

The concentration of the poor within these areas, which typically lack adequate housing, infrastructure and service provision, increases the risk of flooding and ensures that flood impacts are worst for the disadvantaged. Both the developed and developing nations are victims to flood disasters, but responses before, during and after, flooding differs a great deal, hence, the levels of human vulnerability to flooding disaster equally varies, therefore country-specific action(s) is needed to tackle flood disaster, so as to reduced vulnerability and increase level of resilience against the disaster, which prompted this study. However, this incessant flooding, with particular reference to the study area has been wrecking havocs since 2010 on the residents of the affected areas on both human and material costs.

The Study Area and Flooding

Akure, where the study area is located is the capital city of Ondo State, in south-western part of Nigeria, located in latitude $7^{0}15^{1}$N and 7^{0} 28^{1}N of the equator and longitude 5^{0} 6^{1}E and 5^{0} 21^{1} East of the Greenwich meridian, the total land area is approximately 41.2km^{2} [8]. The rate of urbanization in Akure has been on the increase because of the dual roles it plays as the State capital and local government headquarter, hence the population has been on the rise, with the concentration of government administrative activities at both the local and state levels, coupled with other commercial and few industrial activities in the city, where the last official population figure of Akure stands at 353,211 [8]. Ala-River traverse the city of Akure, but the study area as presently occupied is illegal because larger percentage of the occupants do not have the necessary government permit to occupied the study area while those who possess the required documents do not follows the required specifications as regards the major setback as far as water bodies is concerned. Hence the challenges as presently being faced by the occupants of the study area do not receive the required government interventions because, the residents are often time than not viewed as illegal occupants which do not deserved the necessary attention and assistance.

Most of the houses located in the study area are built illegally with no existing physical plan, thereby making it difficult for construction/provision of public infrastructure such as; paved roads, sewage/drainage infrastructure to be provided. Most house owners in the study area do not have legal titles of the existing properties, hence making it difficult for government at the city and local level to provide needed infrastructure for the study area. Therefore, whenever there is heavy downpour of rains little or no assistance comes from the government, however in recent times flooding has been a recurrent disaster because of heavy rain and storm water that overflows it bank. Since the location of the study area is poor and there is absence of infrastructure to handle storm water effectively, the results or consequences of this has always been havocs on lives and properties, also, this damage(s) has been aggravated by unplanned physical development around this illegal settlement with absence of drainage and storm water facilities. The level of poverty in the study area is deemed high, with most people living in overcrowded and squalid condition, where sewage and refuse management equipment are conspicuously missing [8]. Although previous data about the flooding of Ala River flooding have not been documented, but on yearly basis, the study area has always record submerged homes, rods being blocked by

floods, destruction of farlands along the river bank (water body setback) among others.

However, on the part of the city and local governments who are legally bound to ensure safety of life and property of this group of residents could not do anything to salvage the problem, because, governments viewed this group of people as illegal settlers occupying informal area with no approval from governments, no legal right to occupied the area. Also, those who have documents (land titles) to back up ownership of properties, do not complied with Town Planning rules and regulation as regards their building setting up with required distance (setback) to be observed from features like roads, rivers among others which contravenes development control regulations. Also, several options to addressing this challenge have been considered by the government but none seems applicable to correcting the problems, among which are; relocation/resettlement of this vulnerable group-but due to lack of space (land) within the city, the associated cost on both the governments and the people concerned, and the social implications on this group of people, this seems not to be an implementable option.

The issue of government mechanism and the use of Development control instruments such as "stop work order, demolition order, etc" so as to ensure peoples' conformity to rules and regulation of town planning-such instrument as demolition action. Again this seems too dictatorial without human face, hence the only practicable option in this case is therefore an approach that will involves all the stakeholders (i.e the affected residents, the governments and NGOs) multi-sectorial approach need to be advanced, so that every stakeholders will participate to ensure reduction in the levels of vulnerability of these residents to unnecessary disaster risks. While the main focus is to combating the challenges posed by the river Ala flooding is reduced considerably, hence the need to reviewed necessary literatures on multi-sectorial participatory approach to disaster risk reduction is considered in this study where various conceptual issues were considered for the purpose of workable and implementable results.

Participatory Geographical Information System (PGIS) Approach

Among most of the major approaches used in participatory flood risk disaster is Participatory Geographical Information System (PGIS) Approach, since participatory literarily means participation, then GIS is equally defined as a computer-based tool for mapping and analyzing spatially referenced data [10]. In the same vein, Participatory Geographical Information System (PGIS) is defined as the integration of local knowledge as well as stakeholders' perspectives in a GIS [10]. In the context of planning as a confluence of social activity, PGIS is viewed as the integration of input from grassroots organizations with government decision making and technology in specific places or grounded geographies [11]. PGIS can be divided into two major themes, which are; more inclusive access of the various stakeholders to information in the GIS and the inclusion of information from various stakeholders in GIS. While, a more focused area of PGIS is what is now known as Public Participation Geographic Information System (PPGIS), its primary purpose is to use GIS to provide information that can strengthen involvement of communities or marginalized groups in decision making process [12-13].

Challenges of Participatory Risk Disaster Reduction Approach

Flood Risk and Risk Management: Tackling flood in a successful manner, flood risk and disaster management, spatial information is of critical importance, flood risk require static and model information for statistic, [14]. While flood emergencies need semi-static model and most importantly real time information for response operations [15]. Risk management can also be considered to be explicitly more implicitly spatially-oriented [16], this means that risk management is geographical spatially oriented, i.e the topography matters in the physical arrangement of buildings and infrastructure. However, typical application in both risk and disaster management are tried to a possible large geographical area [17] and thus awareness of the importance of spatial information is crucial location awareness. Typically, flood risk and flood disaster are related to each other, but they are not synonyms, but the difference is distinguish between risks and disasters in terms of impact [18]. While risk is associated with any measurable consequences, a disaster signifies a large or catastrophic event. It was also considered that flood risk management applies a wide range of events, while flood disaster (emergency) response attempts to minimize the impacts from a particular flood disaster [14].

The value of a resilient flooding system is its capacity to cope with unforeseen events and longer term drivers, such as global environmental change, recent events have exposed the vulnerability of engineered and economic systems to flooding, and also the complexity of understanding and anticipating the impact of floods. While an integrated analysis of loads, defenses and inundation, in combination with accurate flood mapping,

and consequent impact analysis is required to better understand and quantify flood risks [19-20]. However some of the challenges of flood management observed are the issue of; management of maintenance of flood system, cascading failures and interconnected infrastructure, multifunctional (flood management) infrastructure, impacts of floods on regional and global economy, and predicting and modeling floods i.e taking into account human actions [21].

In a more encompassing manner, the robustness and resilience of flood managements under conditions of uncertainty can be managed through building capacity by (1) Continuous monitoring and analysis of the natural system, flood defenses and protected assets to understand current flood risks and how they might change in the future; (2) Managing vulnerability and exposure of the population and built environment-for example, through awareness raising and training of residents to be aware of their exposure and vulnerability to flood disaster risk, so as to take actions before, during or even after flood disaster outbreak so as to reduce the likely numbers of losses [22]; (3) Reducing the cost of repair, recovery and the time to respond in the event of a flood-not just through improved emergency preparation and response but by exploring alternative models such as greater local access to financial resources and more flexible governance systems [23]; (4) Keeping options open by adopting flexible, multiple use solutions and enhancing variety [24], which may involve development of adaptable engineering techniques in construction and refurbishment. It is crucial to recognize that the flooding system must be considered broadly to include physical processes such as rainfall; man-made systems intended to convey flood discharges and resist or control inundation; economic, social, and environmental assets within a floodplain; organizations with responsibilities for flood risk management and stakeholders with an interest in flooding impacts.

Prospects of Participatory Risk Disaster Reduction Approach

A) Evolving Urban Agricultural system along the river path of Ala River shall serve as a means of providing fresh vegetables, and even fruits to the urban populace and also create means of livelihood for the would-be farmer in the study area.

B) The Ala River water can be used as a mode of establishing fish pond in the urban centre as a means of providing fresh fish, such as catfish for the urban consumption, which equally serves as means of livelihood for the would-be fishermen.

C) Greening of the river path along River Ala by planting shrubs, trees and general greenery would prevent flooding and also serves as an absorber of urban pollution within the city.

D) If the greenery is properly maintained, it can serves as recreational facility for the urban resident with the study area.

Conclusion

The concerned stakeholders should ensured to established, development and management strategies/policies that shall covers the entire water logged and the set back areas of Ala River, while this will ensure strict compliance with some of the prospect identified in this study. Construction of drainages and canals where necessary to reduce flooding, should be intensified by the concerned government Agencies, while provision of coordinated waste management system be put in place to reduce the rate of dumping waste on water and river channels in the study area. Finally coordinated early warning system should be put in place to warned the people ahead of disaster before it happened, however, if all of these are put in place in corporation with the people, it will go a long way to minimized and enhanced participatory risk disaster reduction in Ala River flooding.

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