IMPACTS OF FLOOD DISASTER ON SUSTAINABLE NATIONAL DEVELOPMENT IN IBADAN NORTH LOCAL GOVERNMENT, OYO STATE

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ABSTRACT

The paper investigated impacts of flood disaster on sustainable national development in Ibadan North Local Government Area of Oyo State. Three research hypotheses were postulated and tested at 0.05 alpha level. The research design adopted for the study was survey type. Through purposive randomly sampling techniques, a sampled population of three hundred and twenty residents was used. Data were collected with the use of researcher's structured questionnaire already validated by two experts in the field of Health Promotion and Environmental Health Education and Geography. Pilot testing was conducted using split half method. A reliability coefficient of .78r was obtained. Demographic data collected were analyzed with the aid of frequency counts and simple percentage while the postulated hypotheses were tested with the use of inferential statistics of Chi-square. The results of the study revealed that flood disaster had significant impact on socio-economy, agricultural production and environment. Based on these findings, the researcher recommends that residents are advised to avoid indiscriminate dumping of refuse as this could result into flood disaster and government at all levels should embark on public drainage and bridge construction so as to pave way for water during heavy rainfall.

Key words: *Flood disaster, indiscriminate dumping of refuse, public drainage, bridge construction.*

Introduction

Flood can be defined as an overflow of water that submerges which later dries off gradually (Bradshaw, 2007). The European Union (EU) Floods Directive defines flood as a covering of land by large volume of water (Henry, 2006). Flooding may occur as an overflow of water from water bodies, such as a river or lake, in which the water overtops or breaks, leaves,

resulting in some of that water escaping its usual boundaries. Similarly, it may occur due to an accumulation of rainwater on saturated ground in an areal flood (Bradshaw, 2007).

This natural phenomenon occurs when water runoff from the land exceeds the capacity of the stream channel. Floodwaters replenish soils, recharge groundwater and maintain wetlands. It becomes an economical and political problem only when humans occupy space that streams require for their own natural flood patterns (Sarah, 2007). Both history and myth record innumerable floods. Our reactions to those floods help define our humanity. Flood hazards are the most common and destructive of all natural disasters. Each year, flood disasters cause tremendous losses and social disruption worldwide (James, 2000).

In recent years, risk-based approaches have received increasing attention as means to manage flood hazards. In day-to-day language, the term risk is often used as a synonym for probability or chance. This should not be a surprise since the denotation of the term often varies with the sector in which it is applied (such as, legal profession, insurance, natural disaster research communities and cultural heritage researchers among others) (Mark, 2002). Yet, even in a flood context alone, numerous definitions for flood risk have been suggested (Barredo & Roo, 2010).

Ajayi, (2012) asserted that in mid-July 2012, flooding in the Ibadan metropolis caused some residents at Challenge, Oke-Ayo, and Eleyele to flee from their residences and save their lives. Floods also prevent some Christians from attending their churches services, while countless number of bridges was caved in. The Nigerian government said that certain structures on waterways had to be demolished as a result of the flooding, while former Commissioner for Information and Orientation, Bosun Oladele, announced that there were not any casualties from the flooding (Ajayi, 2012). According to Ola (2014), the city of Ibadan recorded another flood disaster in which some residents lost their lives in the flood that swept Carpet bus stop at Galilee area of Olodo and Apete area and damage to properties on June 28th, 2014 (Ola, 2014).

According to the report of BBC (2012) in late July 2012, at least 39 people were killed due to flood in the central part of Nigeria, Plateau State. Heavy rainfall caused the Lamingo dam to overflow near Jos, sweeping across a number of neighborhoods in Jos and approximately 200 homes were submerged or destroyed. In addition, at least 35 people were missing, while Manasie Phampe, the head of the Red Cross in the state, announced that relief efforts were ongoing. The head of the Red Cross in Plateau state, Manasie Phampe, said rescue efforts were continuing. The floods left 3,000 people homeless, many of whom are taking refugee in government buildings in Jos (BBC, 2012).

Types of flood include overbank, flash flood which gathers steam within six hours of the events that spawned them (Scott, 2007). This is characterized by a rapid rise of fast-moving water (Associated Press, 2010). Kingsford, (2000) asserted that in cold temperatures, bodies of water are often frozen. Heavy precipitation can cause chunks of ice to push together and create a dam in what is known as ice jam flooding. Coastal flood occurs along the edges of oceans and is driven predominantly by storm surges and wave damage. This kind of flooding is usually connected to hurricanes, tsunamis or tropical storm (Mark, 2002).

Among the factors responsible for flood disaster include indiscriminate dumping of refuse inside the stream, river channels, inside the surface drains, along the road side and dumping of municipal wastes on the flood plain (Sarah, 2007 and David, 2004). James, (2000) reported poor urbanization like construction of building along flood plains, large scale encroachment into the river flood plains and large scale road construction with excessive land reclamation which lead to flood disaster. Ajayi (2012) claimed that construction of structures along river course led to flood disaster on the night of 26th August, 2011 in Ibadan. Similarly, inadequacy and poor maintenance of drainage facilities in flood **(**Ajayi, Agboola & Olokesusi, 2012**).**

The impacts on both individuals and communities can have social, economic and environmental consequences which may be negative or positive (Apan, Keogh, King, Thomas, Mushtaq & Baddiley, 2010). As reported by Ajayi, (2012), the immediate impacts of flooding include loss of human life, damage to properties, destruction of crops, loss of livestock, and deterioration of health conditions owing to waterborne diseases. As communication links and infrastructure such as power plants, roads and bridges are damaged and disrupted, some economic activities may come to standstill. People are forced to leave their homes and normal life is disrupted. Similarly, disruption to industry can lead to loss of livelihoods (Ajayi, 2012).

Damage to infrastructure also causes long-term impacts, such as disruptions to supplies of clean water, wastewater treatment, electricity, transport, communication, education and health care. Loss of livelihoods, reduction in purchasing power and loss of land value in the floodplains can leave communities economically vulnerable (Bunn & Arthington, 2002). Floods can also traumatise victims and their families for long periods of time. The loss of loved ones has deep impacts, especially on children. Displacement from one's home, loss of property and disruption to business and social affairs can cause continuing stress. For some people the psychological impacts can be long lasting (Semi, 2010).

According to Douglas, Bunn & Davies (2005), flooding in key agricultural production areas can lead to widespread damage to crops and fencing and loss of livestock. Crop losses through rain damage, waterlogged soils, and delays in harvesting are further intensified by transport problems due to flooded roads and damaged infrastructure. The flow-on effects of reduced agricultural production can often impact well outside the production area as food prices increase due to shortages in supply. On the other hand, flood events can result in long-term benefits to agricultural production by recharging water resource storages, especially in drier, inland areas, and by rejuvenating soil fertility by silt deposition.

Damage to public infrastructure affects a far greater proportion of the population than those whose homes or businesses are directly inundated by the flood. In particular, flood damage to roads, rail networks and key transport hubs, such as shipping ports, can have significant impacts on regional and national economies. Short-term downturns in regional tourism are often experienced after a flooding event. While the impact on tourism infrastructure and the time needed to return to full operating capacity may be minimal, images of flood affected areas often lead to cancellations in bookings and a significant reduction in tourist numbers. Flooding of urban areas can result in significant damage to private property, including homes and businesses. Losses occur due to damage to both the structure and contents of buildings. Insurance of the

structure and its contents against flooding can reduce the impacts of floods on individuals or companies (Kingsford, 2000).

In many natural systems, floods play an important role in maintaining key ecosystem functions and biodiversity. They link the river with the land surrounding it, recharge groundwater systems, fill wetlands, increase the connectivity between aquatic habitats, and move both sediment and nutrients around the landscape, and into the marine environment. For many species, floods trigger breeding events, migration, and dispersal. These natural systems are resilient to the effects of all but the largest floods (Iwena, 2012). The environmental benefits of flooding can also help the economy through things such as increased fish production, recharge of groundwater resources, and maintenance of recreational environments (Jeffrey, 2010).

Areas that have been highly modified by human activites tend to suffer more deleterious effects from flooding. Floods tend to further degrade already degraded systems. Removal of vegetation in and around rivers, increased channel size, dams, levee bank and catchment clearing all work to degrade the hill-slopes, rivers and floodplains, and increase the erosion and transfer of both sediment and nutrients. While cycling of sediments and nutrients is essential to a healthy system, too much sediment and nutrient entering a waterway has negative impacts on downstream water quality. Other negative effects include loss of habitat, dispersal of weed species, the release of pollutants, lower fish production, loss of wetlands function and loss of recreational areas (Allan, Palmer, Hart, Richter, Arthington, Rogers, Meyer & Stanford, 2003)

Prosser, Rutherfurd, Olley, Young, Wallbrink & Moran (2001) asserted that many of our coastal resources, including fish and other forms of marine production, are dependent on the nutrients supplied from the land during floods. The negative effects of floodwaters on coastal marine environments are mainly due to the introduction of excess sediment and nutrients, and pollutants such as chemicals, heavy metals and debris. These can degrade aquatic habitats, lower water quality, reduce coastal production and contaminate coastal food resources.

Flood disaster could be prevented and controlled through, improved drainage efficiency, construction of structures (flood barriers) (Broad, 2005 & Goldenberg, 2009). Increase areas serve as retention basins and mitigation measures, such as restricting land owners from constructing bridges, fences and other permanent structures across watercourses (Jeffrey, 2010 & Bradshaw, 2007).

Research Hypotheses

1. Flood disaster has no significant impact on socio-economic activities of residents of Ibadan North Local area of Oyo State.
2. Flood disaster has no significant impact on agricultural production in Ibadan North Local area of Oyo State.
3. Flood disaster has no significant impact on environment in Ibadan North Local area of Oyo State.

Methodology

This study was carried out with the use of descriptive survey method. The study population comprises of all residents in Ibadan North Local Government**,** Oyo State. A sample of three hundred and sixty (320) was drawn with the purposive random sampling technique. A researcher's structured questionnaire that had been thoroughly validated by experts from both the Departments of Health Promotion and Environmental Health Education and Geography in the University of Ilorin was used for this study. A reliability coefficient of correlation of .78r was obtained through the use of split half method of reliability.

The validated questionnaire was administered in such ways that only the desired number of adult residents were given. Three research hypotheses were formulated and tested with the use of chi-square (X^2) statistical method of analysis. The result of analysis and interpretation of data collected for the result were tabulated and explained below:

Results and Discussion

This dealt with the analysis of the raw data collected through the use of questionnaire administered to three hundred and sixty (320) selected respondents among residents in Ibadan North Local Governent, Oyo State. The results of the analyses were tabulated below:

Hypothesis 1: Flood disaster has no significant impact on socio-economic activities of community members.

Table 1: Chi-square analysis showing impact of flood disaster on socio-economic of community members.

S/N	ITEM	SA	A	D	SD	Row total	Cal X^2	Df	Crit. Value	Rem.
1	Damaging of roads and bridges may occur as a result of flood.	115 (36.0%)	155 (48.4%)	27 (8.4%)	23 (7.2%)	320	70.8	12	21.03	HO Rejected
2	Sudden death is likely to occurred from flood.	135 (42.0%)	168 (53.0%)	10 (3.0%)	7 (2.0%)	320				
3	Loss of belongings may be triggered through flood.	145 (45.3%)	142 (44. 0%)	22 (7.0%)	11 (3.3%)	320				
4	Loss of land value in the flood plains can leave communities economically vulnerable.	160 (50.0%)	145 (45.0%)	7 (2.0%)	8 (3.0%)	320				
5	Flood may result to destitution.	130 (40.0%)	185 (58.0%)	3 (1.0%)	2 (1.0%)	320				
	Column Total	**685**	**795**	**69**	**51**	**1600**				

The findings from the analysis in the table 1 above shows that the calculated chi-square (X^2) values was 70.8 while the table value was 21.03 at 0.05 alpha level of significance with degree of freedom (df) 12. Since the calculated X^2 value of 70.8 was greater than the table value of 21.03, thus, the null hypothesis was rejected, which means that: flood disaster has significant impact on socio-economic of community members.

Hypothesis 2: Flood disaster has no significant impact on agricultural production.

Table 2: Chi-square analysis showing impact of flood disaster on agricultural production

S/N	ITEM	SA	A	D	SD	Row total	Cal X^2	Df	Crit. Value	Rem.
6	Low productivity of crop could result from flood.	152 (48.0%)	140 (44.0%)	20 (6.0%)	8 (2.0%)	320				
7	Difficulty in transporting agricultural products may occur due to flood.	135 (42.0%)	155 (48.0%)	18 (6.0%)	12 (4.0%)	320				

8	Shortages in supply of agricultural products may occur due to flood.	148 (46.0%)	150 (47.0%)	18 (6.0%)	4 (1.0%)	320	64.1	12	21.03	HO Rejected
9	Reduction in tourist numbers may occur due to flood.	105 (33.0%)	170 (53.0%)	30 (9.0%)	15 (5.0%)	320				
10	Widespread damage to crops, fencing and loss of livestock may result from flood.	185 (57.8%)	130 (40.6%)	2 (0.6%)	3 (1.0%)	320				
	Column Total	**725**	**745**	**88**	**42**	**1600**				

The findings from the analysis in table 2 above shows that the calculated chi-square(X^2) value 64.1 against the table value of 21.03 at 0.05 alpha level of significance with degree of freedom (df) 12. Since the calculated X^2 value of 64.1was greater than the table value of 21.03 thus, the null hypothesis was rejected, which means that: flood disaster had significant impact on agricultural production.

Hypothesis 3: Flood disaster has no significant environmental impact.

Table 3: Chi-square analysis showing impact of flood disaster on environment

S/N	ITEM	SA	A	D	SD	Row total	Cal X^2	Df	Crit. Value	Rem.
11	Breeding events, migration and dispersal of crops is attached with flood.	145 (45.3%)	132 (41.3%)	30 (9.4%)	13 (4.0%)	320	107	12	21.03	HO Rejected
12	Increased fish production is associated with flood.	146 (45.6%)	152 (47.5%)	10 (3.1%)	12 (3.8%)	320				
13	Removal of vegetation in around rivers is likely to occur during flood.	165 (51.6%)	95 (29.7%)	40 (12.5%)	20 (6.2%)	320				
14	Loss of habitat and dispersal of weed species may result from flood.	105 (33.0%)	114 (35.0%)	45 (14.0%)	56 (18.0%)	320				
15	Introduction of harmful substances may occur in the environment due to flood.	115 (35.9%)	135 (42.2%)	43 (13.4%)	27 (8.4%)	320				
	Column Total	**676**	**628**	**68**	**128**	**1600**				

The findings from the analysis in the table 3 above shows the calculated chi-square(X^2) value of 107 against the table value of 21.03 at 0.05 alpha level of significance with degree of freedom (df) 12. Since the calculated X^2 value of 107was greater than the table value of 21.03 thus, the null hypothesis was rejected, which means that: flood disaster had significant impact on environment.

Discussion of Findings

The discussion of the findings is as follows;

Table 1 revealed that flood disaster had significant impact on socio-economy. This finding is in line with Ajayi, (2012) who observed that loss of human life, damage to property, destruction of crops, loss of livestock and deterioration of health conditions owing to waterborne diseases, roads and bridges may get damaged and disrupted through flood disaster. This assertion was also supported by Bunn & Arthington (2002) who stated that loss of livelihoods, reduction

in purchasing power and loss of land value in the floodplains can leave communities economically vulnerable and traumatisation of victims may result from flood.

The analysis in table two (2) shows that flood disaster had significant impact on agricultural production. This finding confirms the position of Douglas, Bunn & Davies (2005) that flooding in key agricultural production areas can lead to widespread damage to crops and fencing and loss of livestock. Crop losses through rain damage, waterlogged soils, and delays in harvesting are further intensified by transport problems due to flooded roads and damaged infrastructure. This position was corroborated by Kingsford, (2000) who observed that, tourism infrastructure and the time needed to return to full operating capacity may be minimal, images of flood affected areas often lead to cancellations in bookings and a significant reduction in tourist numbers. He further noted that flooding of urban areas can result in significant damage to private property, including homes and businesses.

Finally, table three (3) revealed that that flood disaster had significant impact on environment. The finding confirmed Iwena (2012) who affirmed that for many species, floods trigger breeding events, migration, and dispersal. Jeffrey, (2010) asserted that the environmental benefits of flooding can also help the economy through things such as increased fish production, recharge of groundwater resources, and maintenance of recreational environments. The result equally supported the position of Allan et al., (2003) stressed that negative effects of flood disaster could be loss of habitat, dispersal of weed species, the release of pollutants, lower fish production, loss of wetlands function and loss of recreational areas.

Conclusion

Based on the above findings, the following conclusions were drawn:

1. Food disaster had significant impacts on socio-economy of community members. It signifies that loss of human life, damage to property, destruction of crops and loss of livestock resulted from flood disaster.
2. Flood disaster had significant impacts on agricultural production. It implies that widespread damage to crops and loss of livestock occurred as a result of flood disaster.
3. Flood disaster had significant impact on environment. The implication is that loss of habitat, dispersal of weeds, release of pollutants and lowered fish production can result from flood disaster.

Recommendations

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

1. Residents are advised to avoid indiscriminate dumping of refuse as this could result to flood disaster.
2. Government at all levels should embark on channelization of public drainages and construction of bridges so as to pave way for water during heavy rainfall.

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