

INDIGENOUS KNOWLEDGE AND RELEVANT RESEARCH

**Proceedings of the Second Annual Research
Conference of Federal University Lafia,
Nigeria, February 3rd-4th 2016**

**Edited by
Victor S. Dugga**



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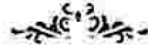
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CHAPTER 24



AN INVESTIGATION INTO COPING STRATEGIES AND MANAGEABILITY OF FLOOD HAZARDS AMONG RESIDENTS OF JALINGO, TARABA STATE, NIGERIA

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ABSTRACT

The paper focused on the understanding of 'coping strategies' and 'manageability' of flood hazard among residents of Jalingo city of Taraba State. Flood Manageability expresses how communities' experience flooding and perceives the hazard in relation to their capacity to deal with the situation, depending on their resources and a range of coping mechanisms. Structured questionnaires relating to coping strategies were purposively administered to 150 respondents in the study area. The study revealed that some of the coping strategies included the movement of people and their properties to higher grounds during the flood, evacuation and abandoning the flooded area, relocating completely from the flooded area and constructing retaining walls, among others. The study recommends the dredging of River Mayo-Gwoi and construction of floods detention infrastructure to reduce the impact of flooding in the study area.

Keywords: Flood hazards, vulnerability, coping strategies, manageability, preparedness.

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INTRODUCTION

Urban flooding frequently impacts on the life of urban dwellers, as a result of which they incur losses (as both direct and indirect costs), and use some measures to cope by adjusting their daily activities such as changing their routine travel routes, allowing longer times for travels, applying preventive measures, and generally preparing for, coping with, and recovering from floods before, during, and after the incidence (Dahiru, 2015).

According to Twigg (2004), 'coping', 'adjustment', or 'survival' strategy is the application of indigenous knowledge and wisdom in the face of hazards and other threats, in order for the people to cope, or adequately respond to the vagaries of the emergent situation. These strategies are the outcomes of experimental processes and innovations, skills development, knowledge, and self-confidence that mitigate the adverse impacts of floods in an area. In the context of this paper, *manageability* is regarded as the way community members experience flooding and perceive the hazard from it in relation to their capacity to deal with the situation, depending on their resources and range of coping mechanisms. The main aim of these strategies is to avoid or decrease the disruption that flooding incidence may cause an affected family. Coping mechanisms are used to protect life, secure peoples' minimal essential requirements of food, shelter, safety, and other basic needs.

The frequency and extent of floods related damages experienced in an area are important policy drivers that stimulate flood policy measures. Flood damage refers to all varieties of harm caused by flooding. It encompasses a wide range of harmful effects on humans, their health and their belongings, on public infrastructure, cultural heritage, ecological systems, industrial production and the competitive strength of the affected economy. Some of these damages can be quantified in monetary terms, others are intangibles and are usually recorded by non-monetary measures like number of lives lost or square meters of ecosystems affected by pollution (Green *et al.*, 1994).

Flood damage effects can be further categorized into direct and indirect effects. Direct flood damage covers all varieties of harm which relate to the immediate physical contact of flood water to humans, property and the environment. This includes, for example, damage to buildings, economic

goods, loss of standing crops and livestock in agriculture, vulnerability and risk perception of human life, immediate health impacts, and contamination of ecological systems, among others. Indirect or consequential effects on the other hand, comprise of damages which occur as a further consequence of the flood and the disruptions of economic and social activities. This damage can affect areas quite a bit larger than those actually inundated (Dahiru, 2015). One prominent example is the loss of economic production due to damaged facilities, lack of energy and telecommunication supplies, and the interruption of supplies of goods and services. Other examples are the loss of time and profits due to traffic disruptions, disturbance of markets after floods (e.g. higher prices of food or decreased prices of real estate near floodplains), reduced productivity, with the consequence of decreased competitiveness of selected economic sectors or regions and the disadvantages connected with reduced markets and public services (Smith and Ward 1998; Green *et al.*, 1994).

The actual amount of flood damage of a specific flood event depends on the vulnerability of the affected socio-economic and ecological systems, that is broadly defined on their potential to be harmed by a hazardous event (Cutter 1996, and Mitchell, 1989). Generally speaking, an element at risk of being harmed is the more vulnerable, the more it is exposed to a hazard and the more it is susceptible to its forces and impacts. Therefore, any flood vulnerability analysis requires information regarding these factors, which can be specified in terms of element-at-risk indicators, exposure indicators, and susceptibility indicators.

Flooding is the most common environmental hazard in Nigeria (Etuonovbe, 2011). The damages and losses due to floods' hazards are the consequence of human actions like urbanization (Action Aid International, 2006). As more and more people converge in cities, so does the effects of flooding intensify, as a result of which even quite moderate storms produce high flows in rivers because there are more hard surfaces than drains. According to Al-Ghamdi *et al.* (2012), flash floods are the most dangerous type of natural disasters in arid regions, and hence precise flood assessment is an important demand in places like Makkah, Saudi Arabia due to the nature of its rainfall, which often cause hazardous flash floods in the area.

According to Ojeh (2012), enormous financial resources are always required to take care of flood devastations in an area. Flooding has far reaching implications on its affected areas in terms losses, and wellbeing of the people (Dahiru, 2015), as was the case stated by Ujah (2007), in the southern states of

Lagos, Delta, Rivers, Bayelsa, Akwa Ibom, as well as States along rivers Niger and Benue like Adamawa, Taraba, and Kogi. Flooding events are also usually not limited to destruction of physical structures but are also accompanied with prevalence of diarrhea and other waterborne diseases as most sources of water are polluted, as well as increased poverty due to destruction of farmlands, disruption of essential services, destruction of homes, and other properties (Olajuyigbe, Rotowa, and Durojaye, 2012).

This study aimed to investigate the coping strategies and manageability of flood hazards among residents of Jalingo city of Taraba State. The specific objectives of the study are:

- i) to identify the economic losses due to urban flooding in this area.
- ii) to identify factors responsible for flooding in this study area.

STUDY AREA

The study area is Jalingo, the capital city of Taraba State. The city is bordered by Yoro to the east, Lau to the northwest, and Ardo-Kola Local Government Areas to the south. It is located on Latitude 8°54'N and Longitude 11°22'E (Figure 1). Jalingo has an estimated population of 118,000 people (NPC, 2006), occupies a total land area of 219.18km², and it is blessed with vast plain lands surrounded by mountains. It has very fertile soils, and endowed with a variety of economic minerals like: feldspar, clay, quartzite, limestone, granite, pyrite, tourmaline and zircon, among others (Araen, et al, 2015).

The climate of Jalingo is that of the tropical savanna, with temperature range of 18C- 36C. (1991-2007) and an annual rainfall of about 1,500mm (Williams & Mary, 2007). Jalingo is surrounded by hills and mountains and vast plain land. The area is well drained, and the town is traversed by two important rivers which support the cultivation of different cash and food crops.

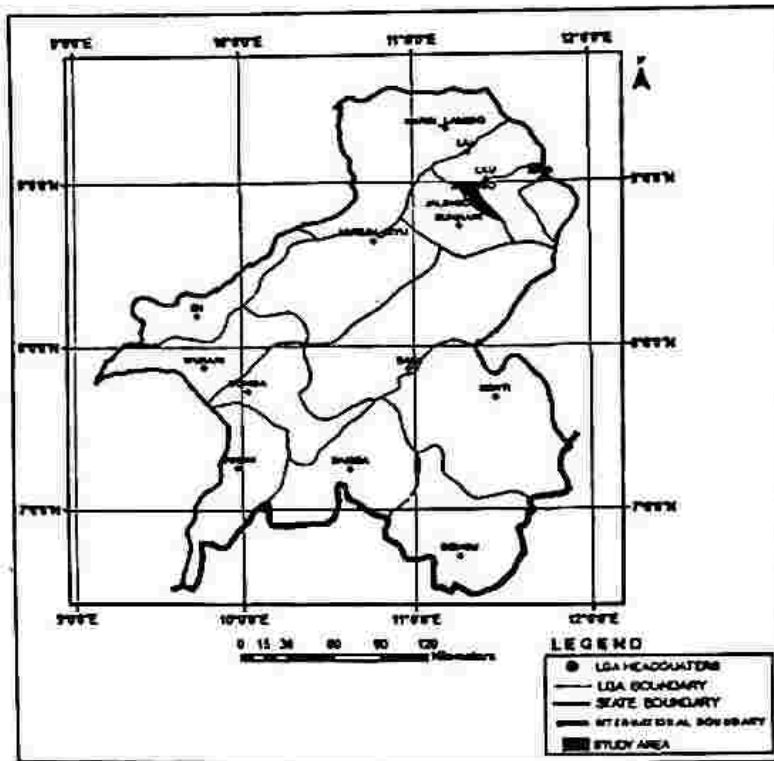


Figure 1: Map of Taraba State showing Jalingo city (Source: Ministry of Land and Survey, Jalingo).

DATA COLLECTION

Structured questionnaires relating to coping strategies were purposively administered to 150 respondents in the study area. Descriptive statistics using percentages was used to determine the proportions of variables outlined in the questionnaire administered.

RESULTS AND DISCUSSION

Table 1: Respondents' view on floods' coping Strategies

| Coping Strategy | Frequency | Percentage |
|--|-----------|------------|
| Move property to higher ground temporarily | 34 | 22.7% |
| Evacuate/abandon flooded area | 4 | 2.7% |
| Complete Relocation | 3 | 2% |
| Clearing of waterways | 108 | 72% |
| Others | 1 | 0.7% |
| Total | 150 | 100 |

According to Table 1, one of the main coping strategies by the respondents is moving their properties to higher grounds during flooding events, 22.7% of the respondents say that they resort to the strategy of moving their property to higher areas temporarily. This is second to the age long practice of clearing of water ways, especially at the onset of the rains, where 72% of the respondents use the strategy in this area. The third and fourth most important strategies are those of outright evacuation and abandoning of their homes (2.7%) and completely relocating from affected areas (2.0%), with others (0.7%) as the least. In spite of the many problems faced by people during floods, some people *continue staying in the area as the cost of land in the city centre is prohibitive to them (too high) and so they prefer to manage the flood hazard since they cannot afford pieces of land and lifestyle elsewhere, for now.*

Adoption of a given coping strategy in flood hazards depends on the experience and preference of affected persons. These mechanisms play important roles in the manageability of a given flood event. Coping strategies to be implemented by flood victims depends on the severity of the official warnings, the current status of the weather and the people's knowledge of the potential evolution of the flood or typhoon in their surroundings. The awareness of flood behaviour, or trend leads to adoption of one or several of the diverse protective mechanisms, with individual households' manageability decision based on several factors, known as a subjective 'multi-criteria' judgment that includes:

- i) *Flood coping/manageability behaviour in Green Beach resort area of Jalingo:* In this area, because of previous experiences, the people know the potential depth and duration of typical floods in their surroundings, based on which they put necessary measures to mitigate its impacts, as shown in Plate 1.

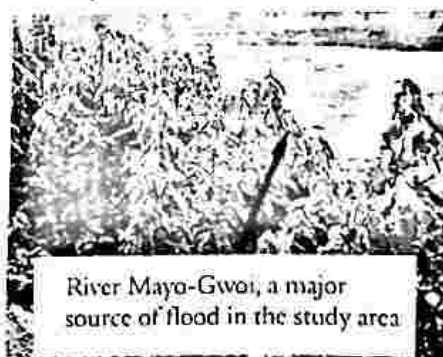


Plate 1: A house located between 15-20m away from River Mayo-Gwoi, Jalingo, Taraba State.

ii) *Perceptions of spatial location in relation to flooding:* This is determined by the people's consciousness of the local variations in the topography of an area in relation to the location of residences and closeness to the paths of flooding. Field investigations by the Authors revealed that some houses are located at an average of 15m-20m from the river channels and these locations are very close to the paths of flooding. This was observed in settlement along River Mayo-Gwoi through Green beach resort to Nukkai ward (Plate 2).



Plate 2: River Mayo-Gwoi threatening the wall of Green Beach Resort. Mayo-Gwoi bridge, Jalingo.

iii) *Awareness of levels of physical exposure:* this is determined basically by the measure of safety that houses inhabited can provide for the people, and their belongings (Plate 3).

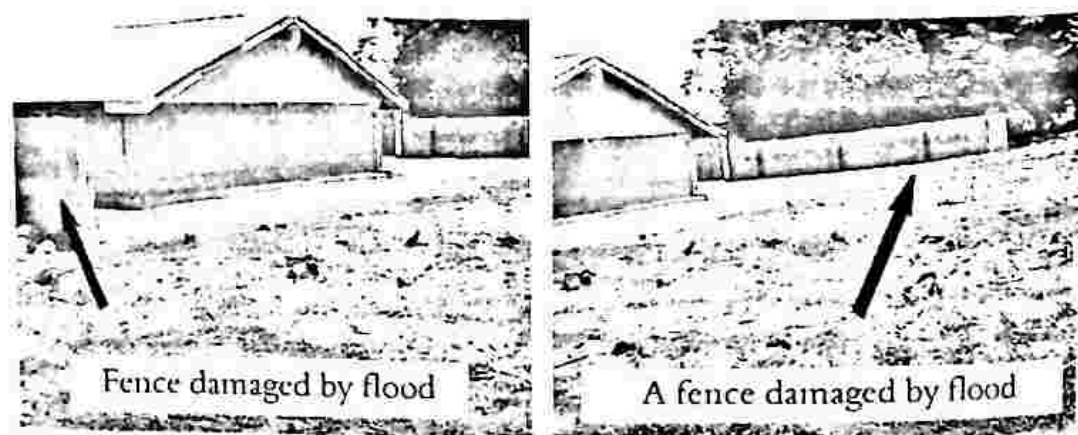


Plate 3: Jerusalem Prophetic Ministry, Jalingo fence pulled down by flood along Mayo-Gwoi stream

- iv) *Perceptions of socioeconomic capacity or floods hazards resilience, through awareness of potential environmental problems associated with the presence of pollutants, human and animal waste (Plate 4)*



Coastal erosion and siltation responsible for flood in the area



Mayo-Gwoi River threatening a fence

Plate 4: River Mayo-Gwoi, the major cause of flood in the study area.

- v) *Perceptions of the state of affairs for the whole community determined by the levels of dislocation experienced by other households in their own zone and the whole ward.*

During the Focus Group Discussions, it was discovered that most households usually try to delay evacuation of family members and belongings to flood-free areas until the last possible moment. This behaviour is understandable: while they stayed in their own homes, they perceived the disruption can be kept at manageable levels. Moving to an evacuation centre means putting their lives and decisions in other people's hands and this usually leads to serious inconveniences.

At family level, the situation is still found to be *manageable*. In the first case, the disturbance comes from aspects such as the interruption of normal activities (e.g. schooling). In this case, working parents have to allocate time from their normal economic activities in order to take care of the young and the aged ones. For people living in houses that are at ground level or not sufficiently elevated, domestic and every day activities such as cooking, sleeping and cleaning are highly disrupted because of the intrusion of floodwaters. The use of basic sanitary facilities such as private and public faucets, toilets and pumps stop as the facilities are partially covered by floodwaters. Difficulties of mobilization arises as many roads and pathways are flooded. In addition, economic activities such as street vending, washing

clothes and small 'in house' shops and food stalls have to be totally or partially stopped. The interruption of income-generating activities may represent up to 30% cutback in the daily income of many households, especially those settled in the low-lying environment along River Mayo-Gwoi to Nukkai areas of the city. This stage also poses a higher exposure to diseases, as the people that still commute to work or perform some forms of domestic tasks (like collecting potable water from flood-free areas) have to wade amidst stagnant water. In addition, it was found that in some sectors, children are allowed to swim and play in the polluted water, thereby increasing their chances of contracting diseases.

In the second case (long-standing water), the disturbing aspects come from the presence of pooled (usually polluted) water as this provides an ideal breeding ground for mosquitoes and water-borne and skin diseases, all of which according to respondents, represent extra load of stress to people's already difficult life.

CONCLUSION

This study examined the coping strategies and manageability of flood hazard among residents of Jalingo city of Taraba State. The understanding of mechanisms for coping and adaptation to flooding and other natural phenomena is not always straightforward to external factors such as researchers and policy-makers. Therefore, the mechanisms for dealing with it or avoiding it are perceived differently by those that see flooding as a phenomenon to measure and model, those taking decisions for instance about urban development, public investment or land use change and those that have to deal with flooding in their everyday life and in consequence have to face and manage the threat.

From the foregone, flood and flood related hazards are important issues in this study area with far reaching implications on the overall development and wellbeing of the people that all stake holders must put their hands on deck to ensure that their adverse impacts are adequately mitigated.

RECOMMENDATIONS

1. Provision of flood infrastructure: The Government should provide flood infrastructure in places that are liable to flood. The government should also dredge the major water channels to increase the depth and load carrying capacity, this would avert situation of water overflowing the banks of channels to cause destruction of lives and property.

2. Government should provide alternative land for those living in flood prone areas to enable them relocate.
3. Sustainable waste management: Tackling indiscriminate waste in water channels and desilting water channels which hitherto have been silted up thereby causing flooding of major roads.
4. Environmental education should be built into school curriculum and proper awareness should be created through the press.
5. Residents should make it a point of duty to provide proper drainage system and keep them clean at all times to enable the free flow of water to low lying environment.
6. The public should hold the environment with utmost sense of responsibility, as our timeless heritage, and not as a resource that we are generally apart from, or that which must be conquered at all fronts, in a frontier mentality as opined by Chiras, 1982 because of the erroneous belief that the earth and its resources are infinitely available for us all, to freely use, even abuse, and pass on to the next generation a development that is essentially responsible for most of the current environmental problems bedeviling this area.
7. The State should ensure the emplacement and operationalization of good environmental/developmental policies consistent with the aspirations and wellbeing of the people, as well as ensure that all indiscriminate activities inimical to environmental sustainability and wellbeing are not only frowned at, but the culprits are exemplarily met with commensurate punitive measures that will serve both as deterrent and a prevention against such further developments in the State through creative approaches, courageous policies, regulations and their enforcements.

REFERENCES

- ActionAid International (2006). Climate change, urban flooding and the rights of the urban poor in Africa. Key findings from six African cities UK, Books for Change. Pp 1-8.
- Al-Ghamdi1, K.A., Elzahrany, R.A., Meraj, N, Mirza1, M.N. and Dawod, G.M. (2012). Impacts of urban growth on flood hazards in Makkah City, Saudi Arabia, *International Journal of Water Resources and Environmental Engineering*, 4(2):23-34.
- Araen, A.S., Ali, A.Y., Mashii, A. S., Shenpam, G.D. and Andembomtop, K.D. (2015). An Assessment of Flood Hazard Responses Among the

- Residents of Katsina Metropolis, Katsina State, Nigeria. *Asian Journal of basic and Applied Science*, 3(1): 31-47.
- Cutter, S.L. (1996). Vulnerability to environmental hazards. *Progress in Human Geography*, 20(4):529-539.
- Dahiru, M. K. (2015). Impact of Barytes Mining on the Environment of Azara area of Nasarawa State- Nigeria. PhD. Thesis. Geography and Planning Department. University of Jos.
- Etuonovbe, A.K. (2011). Devastating Effects of Flooding in Nigeria. FIG Working Week. 18-22 May 2011.
- Green C., van der Veen, A., Wierstra E. and Penning-Rowsell, E. (1994). Vulnerability redefined. analysing full flood impacts in Penning-Rowsell E., Fordham M. (Eds.). *Floods across Europe – Flood hazard assessment, modeling and management*. Middlesex University Press. London. *Sustainable Development*, Vol. 3.No.7.
- Mitchell, J.K. (1989). Hazards research. In: Gaile, G.L., Willmot, C.J. (Eds). *Geography in America*. Columbus, OH: Merrill. Pp. 410-424.
- Ministry of Land and Survey. Jalingo, Taraba State. Map of Taraba State showing Jalingo city.
- Ojeh & Ugboma (2012). Flood hazards in Urban Niger Delta: A case study of Abraka Town. *International Journal of Environmental Engineering Research*, 1(1):23-29.
- Olajuyigbe, A.E, Rotowa, O.O and Durojaye, E. (2012). An Assessment of Flood Hazard in Nigeria: The Case of Mile 12, Lagos. *Mediterranean Journal of Social Sciences*, 3(2):367-377.
- Smith, K. and Ward, R. (1998). *Floods – Physical processes and human impacts*. Chichester.
- Twigg, J. (2004). Good practice Review: Disaster Risk Reduction. Preparedness in Development and emergency programming. Overseas Development Institute, III Westminster.
- Ujah, O. C. (2007). *Internal displacement in Nigeria*. The African Institute for Applied Economics (AIAE www.aiaenigeria.org) in Enugu State. Nigeria. P 37.