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## HOUSEHOLDS' ABSORBABILITY AND ADAPTABILITY COPING CAPACITY TO THE IMPACT OF FLOOD DISASTER IN ILE-IFE, NIGERIA

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### Abstract.

**Purpose.** The purpose of this study is to examine households' absorbability and adaptability coping capacities in response to flood disasters in Ile-Ife, Nigeria. The research seeks to understand how coping strategies vary across different residential zones and how socioeconomic characteristics influence these variations.

**Design/methodology/approach.** Residential areas in Ile-Ife were stratified into three developmental zones: core, transition, and suburban. Using a multistage sampling technique, a total of 493 household heads were selected. Data were collected and analyzed to assess households' coping capacities in relation to flood hazards.

**Findings.** The results revealed that both absorbability and adaptability coping capacities differed significantly across the three zones. These variations were strongly influenced by the socioeconomic characteristics of household heads. The suburban zone, in particular, demonstrated weaker adaptability, highlighting the vulnerability of residents in this area.

**Originality.** This study contributes to disaster risk reduction literature by providing empirical evidence on the relationship between socioeconomic characteristics and coping capacity in a flood-prone Nigerian city. It emphasizes the need for targeted policies, especially in suburban areas, to improve pre-disaster management activities, such as identifying flood-prone locations and issuing early warnings to residents.

**Keywords:** Flood Disaster, Coping Capacities, Households, Ile-Ife, Resilience.

### Introduction

Over the years, countries of the world have experienced the impact of climate change as evident in the magnitude and frequency of extreme weather hazards, one of which is flood (World Bank, 2013; Maddox, 2014; Monier & Gao, 2015). Flood hazard is the coverage of water in an environment that is not normally covered by water and with potentials of causing harms to urban environment (Odunsi, 2020). When the impacts are significant, a flood hazard become flood disaster. The global escalation of flood disaster, however, has made them an existential so-

cietal concern and a threat to the achievement of sustainable environment.

Recently, there has been noticeable rise in the magnitude and frequency of flood disaster with wide reaching impact on households and community members in both developed and developing countries (World Bank, 2015; Adelekan & Asiyanbi, 2016; Shah et al., 2018; Hofmann & Schuttrump, 2019). In the last decade, more than 105 million people in the world have been affected by flood disaster with fatalities, displacement of people and destruction of infrastructure (CRED & UNDRR, 2020; UNISDR, 2022; Mobolaji et al., 2025). While flood disaster

is an experience globally, the developing countries, particularly those in sub-Saharan Africa, are disproportionately vulnerable to the impact of disaster.

In Nigeria, for instance, floods is the most common disaster and the impact is similar to the experience in other developing countries (Amangabara & Obenade, 2015; Komolafe et al., 2015; World Economic Forum, 2019). Vulnerability of Nigerian cities to flood disaster is a reflection of several factors. These include uncoordinated urban planning, illegal building on river setbacks and waste dump on drainage channels (Daramola & Mobolaji, 2024). However, the Federal Government of Nigeria have made some efforts to manage flood disaster in the country. Among these efforts are the promulgation of statutory laws and policies, and relocation of flood disaster victims to internally displaced camps [IDPs] during flooding, among others. In spite of these efforts, approaches to disaster management remain largely pedestrian in the country (Odunsi et al., 2024). This is because Government efforts have always been a reactive approach. Households as primary receptor of the impact of flood disaster therefore must be resilient.

Households' resilience to flood disaster is the ability of households or individual occupying the same dwelling to absorb, adapt and transform in response to the impact of disaster (Herrman et al., 2011; Kien, 2011; Lucini, 2014). In another parlance, resilience to disaster is the effort of households to evolve coping capacity in order to sustain their living standard for preparation and mitigation of disaster. Operationally, households' resilience to flood disaster is the enablement of a household to evolve absorbability and adaptability coping capacity to the impact of flood disaster. It emphasizes proactive and reactive approaches to cope with the impact of flood disaster.

In managing the impact of flood disaster, household should be able to evolve absorbability and adaptability coping capacity (Folke et al., 2010; Rossi et al., 2012; Patryniak, 2016). Absorbability is the capacity of the households to take intentional protective action to buffer flood disaster. On the other hand, adaptability involve households' capacity for flexibility and incremental adjustment by changing conditions due to flood disaster. This suggest that coping with flood disaster involve actions, flexibility and adjustment before and after flood disaster. However, while several studies have documented disaster resilience capacity, studies on households' resilience, particularly regarding absorbability and adaptability coping capacities in traditional cities of developing countries such as Nigeria, are scanty in the literature.

Ile-Ife, an urban centre with extensive traditional areas and rapidly growing suburbs has a history of flood disaster. Historically and into present, Ile-Ife suffer from devastating floods, even in recent years, with many residents in Ede Road, Mayfair, Aserifa, and Road 7 area experiencing severe flooding causing significant and extensive havoc to both lives and properties (Afolabi et al., 2024). Therefore, households in these areas should be able to absorb and adapt to flood disaster as they continue to live in these areas despite the perennial flood disaster and impact. Moreover, coping with the impact of flood disasters is key in building flood disaster resilient cities because human activities at the household level make significant contributions to make or mar the city. This study therefore examined households' absorbability and adaptability coping capacity to the impact of flood disaster in Ile-Ife, Nigeria.

### Literature review

The impact of flood disaster on households and community members is gaining momentum in global and local discourses. In Nigeria, particularly Ile-Ife, a traditional and urbanized city, there have been flood disaster causing fatalities, displacement and physical and economic losses (Ijaware, 2020; Iyiola, 2024). The level of impact of flood disaster on households in Ile-Ife thereby raises concerns about households' absorbability and adaptability coping capacity, hence this study.

Studies have shown that socio-economic characteristics of households constitute a significant determinant of coping capacity to the impact of disaster (Akter & Mallick, 2010; Keating et al., 2020; Odunsi, 2020). For instance, Keating et al. (2020) indicated that income level enhance coping capacity to the impact of oil spills in South Louisiana. In this case, poor rural residents tend to have less coping capacity in comparison with the middle-income urban residents. Also, Akter and Mallick (2010) indicated that low-income households were less resilient to the impact of flood disaster than high-income households in Bangladesh. This suggest that socioeconomic characteristics reflects in coping capacity to disaster. Although, these studies focused on different types of disaster which was conducted in developed countries, the significance of socioeconomic characteristics is key in this study.

Literature also abounds on diverse components and dimensions of disaster resilience (Bene et al., 2012; Lucini, 2014; Bangalore et al., 2017). Bene et al. (2012) identified physical, natural, physical, insti-

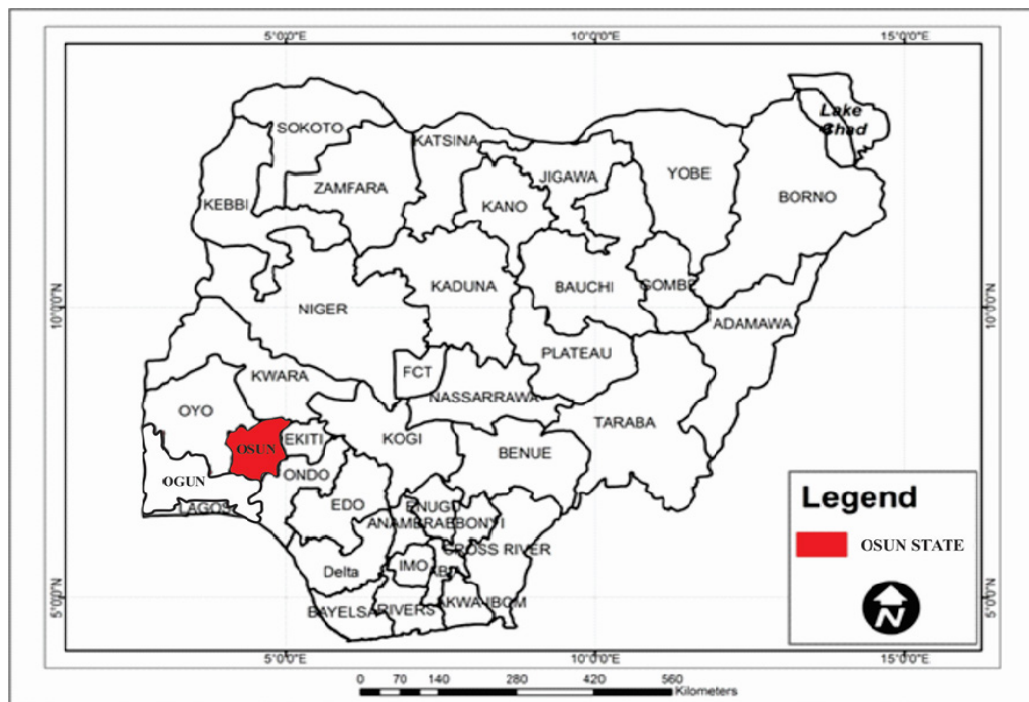
tutional, social and economic dimension of households as coping mechanism to disaster. In the same vein, Bangalore et al. (2017) identified components of resilience as mitigation, preparedness, response and recovery. The components indicate stages of adaptation and recovery of victims. However, despite different components of disaster resilience, absorbability and adaptability overlapping coping capacity have been applied in different disaster resilience contexts studies and the components were both short- and long-term recovery outcomes. Thus, due to the significance and importance of the coping capacity, it is pertinent to assess households' resilience to flood disaster based on absorbability and adaptability coping capacity in a traditional city of Ile-Ife, Nigeria.

### Methodology

The study area, Ile-Ife is one of the prominent traditional and urbanized cities in Osun State, Nigeria (Figure 1 and 2). The city lies between latitudes  $7^{\circ}28'N$  and  $7^{\circ}45'N$  and longitudes  $4^{\circ}30'E$  and  $4^{\circ}34'E$  with average elevation of 268m above sea level. Ile-Ife with its long history of tradition, culture and art is regarded as the origination of Yoruba ethnicity in Southwestern Zone of Nigeria. With two of its local government areas located in the metropolis (Ife Cen-

tral and Ife East), the town experienced tropical climate with an average annual temperature of  $21.3^{\circ}C$  and annual rainfall of 1509mm. Evidence of urbanization in the city dates back to 500 AD (Mabogunje, 1968).

Over the years, human activities and urbanization have taken quite toll of high forest vegetation in Ile-Ife. Out of the 21 wards in the LGAs of Ile-Ife, 17 wards are in the built area of the city. In the same vein, urbanization has further enhanced and supported human activities in the city. Typical examples are the increasing demand for trees to build factories, shopping complex and residential buildings. Demand for trees in terms of deforestation coupled with uncontrolled urban growth have culminated to flood disaster. For instance, the deadly 2020 flood disaster in the city were attributed to deforestation and victims building on river setback (Ijeware, 2020). This suggest that the city is susceptible to flood disaster as a result of nature and human activities. Therefore, households must evolve coping capacity to the impact of flood disaster especially in the three developmental zones (core, transition and suburban) of the city. Households in the developmental zones of the city have differential social, economic and physical attributes but with varying degrees of resilience to flood disaster (Daramola et al., 2022).



**Figure 1** – Map of Nigeria Osun State Showing Ife East and Ife Central LGA  
Source: National Space Research and Development Agency [NARSDA], (2024)





household size and the years spend in the study area by households' heads. These variables are important elements in examining opinion about environmental issues and also to evaluate the respondents' opinion on their absorbability and adaptability coping capacity to the impact of flood disaster (Odunsi et al., 2023; Mobolaji et al., 2025). Therefore, as presented in Table 1, findings were made on the socioeconomic characteristics of respondents in the study area.

Across the study area, findings revealed that 58.4% of the respondents constituted male gender while 41.6% accounted for their female counterpart. In the core zone, it was revealed that 59.6% which formed the majority accounted for male and it was the same in transition zone with 60.1% of the respondents that were also accounted for male gender. Also, similarity exist in the suburban zone with 55.4% of the respondents that accounted for male whereas 44.4% of the respondents were female. Further findings indicated that 40.4% and 39.9% of the respondents were female in the core and transition zones respectively. This implied that male respondents were more available during the survey and even more environmentally conscious that their female counterpart in the three zones. The findings also reflect in the Chi-square result ( $\chi^2 = 2.189$ ,  $p = 0.212$ ) that there was no significant association between gender and developmental zones.

Findings further indicated that majority (53.3%) of the respondents were between 40 to 59 years of age and similarity exist in the three zones. Unlike in the core where 28.9% of the respondents were above 60 years, fewer respondents 14.1% and 17.6% constituted 20 to 39 years of age in the transition and suburban zones respectively. Impliedly, adult who are in the age bracket of 40 to 59 years formed majority of the respondents. This suggest that adult who are agile were in the study area and their availability could enhance absorbability and adaptability coping capacity to flood disaster. The findings are supported by Analysis of Variance result ( $F=2.691$ ,  $P = 0.105$ ) which revealed that significant variation is perceived in the age distribution of the respondents. Age of the respondents therefore is a determinant of coping capacity to the impact of flood disaster.

Information on the educational attainment of respondents revealed that majority (56.9%) had secondary education while 47.2% of the respondents attained tertiary education level in the study area.

Further findings indicated that secondary education which was common in the core and transition zones accounted for 66.8% and 72.2% respectively unlike in the suburban where majority (67.6%) attained tertiary educational level. This is a clear indication that there is varying degrees of education attainment in the three zones. However, the findings are further confirmed by the Chi-square test ( $\chi^2 = 2.112$ ,  $p = 0.221$ ), which indicated that there was no significant association between respondents' education and developmental zones. Education of the respondents may likely enhance capacity to absorb and adapt to the impact of flood disaster. Meanwhile, income distribution which was to determine respondents' coping capacity to the impact of flood disaster was similar across the three zones.

Furthermore, findings revealed that 24.7% of the respondents have stayed not less than 15 years while 35.4% of the respondents have spent above 35 years in their zone. In the core zone, 48.7% of the respondents have stayed over 30 years unlike 54.8% in the suburban that have stayed between 15 to 30 years. Likewise, fewer (8.1%) of the respondents have stayed above 30 years in the suburban zone. This implied that years spent in an area could enhances households' coping capacity to the impacts of flood disaster. Furthermore, one third (38.1%) of the respondents had between 6 to 10 household size and this is common across the study area. Although, in the suburban zone, majority 51.2% had between 1 to 5 household size unlike 42.6% and 46.7% with household size of above 10 in the core and transition zones respectively. On the type of house occupied by respondents, findings revealed that 29.4% of the respondents resides in detached bungalow while 25.9% occupied semi-detached bungalow. Except the 42.8% in the suburban zone that reside in duplex, fewer 16.1% and 14.9% occupied duplex in the core and transition respectively. This indicated that detached bungalow building which is easily susceptible to flood disaster is common in the study area.

Based on the foregoing, findings revealed that there is varying degrees of respondents' socioeconomic characteristics in the three zones. As a result, socioeconomic characteristics of the respondents could be a determinant to absorbability and adaptability coping capacity to flood disaster in the study area.

**Table 1** – Socioeconomics Characteristics of Respondents

| Parameters             | Developmental Zones |            |            | Total      |
|------------------------|---------------------|------------|------------|------------|
|                        | Core                | Transition | Sub-Urban  |            |
| Gender                 |                     |            |            |            |
| Male                   | 108 (59.6)          | 89 (60.1)  | 91 (55.4)  | 288 (58.4) |
| Female                 | 73 (40.4)           | 59 (39.9)  | 73 (44.6)  | 205 (41.6) |
| Total                  | 181 (100)           | 148 (100)  | 164 (100)  | 493 (100)  |
| Age                    |                     |            |            |            |
| ≤ 20                   | 2 (1.1)             | 8 (5.4)    | 11 (6.7)   | 21 (4.2)   |
| 20 – 39                | 36 (19.8)           | 21 (14.1)  | 29 (17.6)  | 86 (17.4)  |
| 40 – 59                | 91 (50.2)           | 87 (58.7)  | 85 (51.8)  | 263 (53.3) |
| 60 – Above             | 52 (28.9)           | 32 (21.8)  | 39 (23.9)  | 123 (25.1) |
| Total                  | 181 (100)           | 148 (100)  | 164 (100)  | 493 (100)  |
| Educational Attainment |                     |            |            |            |
| Primary                | 18 (9.9)            | 2 (1.5)    | -          | 20 (4.1)   |
| Secondary              | 121 (66.8)          | 107 (72.2) | 53 (32.4)  | 281 (56.9) |
| Tertiary               | 42 (23.3)           | 39 (26.3)  | 111 (67.6) | 192 (47.2) |
| Total                  | 181 (100)           | 148 (100)  | 164 (100)  | 493 (100)  |
| Average Monthly Income |                     |            |            |            |
| ≤ #30,000              | 88 (48.6)           | 51 (34.4)  | 14 (8.5)   | 153 (31.0) |
| ≤ #60,000              | 68 (37.5)           | 69 (46.5)  | 49 (29.8)  | 186 (37.7) |
| ≥ #61,000              | 25 (13.9)           | 48 (19.1)  | 101 (61.7) | 174 (31.3) |
| Total                  | 181 (100)           | 148 (100)  | 164 (100)  | 493 (100)  |
| Number of Years Spent  |                     |            |            |            |
| ≤ 15 years             | 37 (20.4)           | 24 (16.2)  | 61 (37.1)  | 122 (24.7) |
| 15 – 30 years          | 56 (30.9)           | 51 (34.4)  | 90 (54.8)  | 197 (39.9) |
| ≥ 30 years             | 88 (48.7)           | 73 (49.4)  | 13 (8.1)   | 174 (35.4) |
| Total                  | 181 (100)           | 148 (100)  | 164 (100)  | 493 (100)  |
| Household Size         |                     |            |            |            |
| 1 – 5                  | 42 (23.2)           | 20 (13.5)  | 84 (51.2)  | 146 (29.6) |
| 6 – 10                 | 62 (34.2)           | 59 (39.8)  | 67 (40.7)  | 188 (38.1) |
| Above 10               | 77 (42.6)           | 69 (46.7)  | 13 (8.1)   | 159 (32.3) |
| Total                  | 181 (100)           | 148 (100)  | 164 (100)  | 493 (100)  |
| Type of House Occupied |                     |            |            |            |
| Detached Bungalow      | 52 (28.7)           | 50 (33.7)  | 43 (26.2)  | 145 (29.4) |
| Semi-Detached Bungalow | 61 (33.7)           | 36 (24.3)  | 31 (18.9)  | 128 (25.9) |
| Story Building         | 39 (21.5)           | 40 (27.1)  | 20 (12.1)  | 99 (20.1)  |

Continuation of the table

| Parameters   | Developmental Zones |                  |                  | Total            |
|--------------|---------------------|------------------|------------------|------------------|
|              | Core                | Transition       | Sub-Urban        |                  |
| Duplex       | 29 (16.1)           | 22 (14.9)        | 70 (42.8)        | 121 (24.6)       |
| <b>Total</b> | <b>181 (100)</b>    | <b>148 (100)</b> | <b>164 (100)</b> | <b>493 (100)</b> |

Note – compiled by the authors

*Households' absorbability coping capacity to the impact of flood disaster*

Findings were made on the households' absorbability coping capacity to the impact of flood disaster in the three developmental zones of Ile-Ife, Nigeria. Variables employed by households to absorb the impact of flood disaster involved households having local knowledge of early warning of disaster and access to personal financial resources. As indicated by Odunsi (2020) foreknowledge of a disaster allows for those concerned to adequately plan and reduce their vulnerability to disaster. Consequently, as presented in Table 2, findings were made on the respondents' absorbability capacity to the impact of flood disaster in the study area.

Findings were made on the availability of infrastructure that can withstand flood disaster in the study area. It was discovered that majority (56.2%) of the respondents does not have infrastructure that can withstand the impact of flood disaster in their homes while about one third (43.8%) of the respondents had availability of infrastructure across the three zones. Also, less than half of the respondents opined that there is availability of infrastructure that can withstand flood in the study area. As a result, households' absorbability to flood disaster through infrastructure that can withstand the impact of flood disasters was low in the three zones. This is confirmed by the Chi-square test result ( $\chi^2 = 2.213$ ,  $p = 0.181$ ), which indicated that there was no significant association between infrastructure that can withstand the impact of flood disaster and developmental zones.

Evidences in the study area indicated that households absorb the impact of flood disaster through infrastructure such as building, drain and green spaces that could withstand flooding. Thus, findings revealed that 44.6% of the respondents declared building as the predominant infrastructure that can

withstand flood disaster across the study area. In the same vein, 30.6% which formed one third of the respondents indicated that drain can withstand flood disaster. Furthermore, just fewer 24.8% of the respondents believed that green spaces is the only infrastructure that can withstand the impact of flood disaster. Therefore, based on the findings, it is a clear indication that slightly about one third (44.6%) of the respondents indicated that infrastructure particularly building could withstand the impact of flood disaster, even though, it was common in the transition and suburban zones.

In order to examine households' absorbability to the impact of flood disaster, local knowledge of flood disaster was examined in the study area. Findings revealed that 39.7% of the respondents had local knowledge of early warning to flood disaster and this were more prominent in the core and transition zones. Except in the suburban zone where 55.4% of the respondents had the knowledge just at a time, majority (52.4% and 50.6%) had local knowledge early warning in the core and transition zones respectively. This imply that core and transition zones were more susceptible to flood disaster than suburban zone. As a result, absorbability coping capacity through local knowledge of flood disaster were early and there is downward decrease from the suburban to core zone.

Lastly, 52.9% that formed half of the respondents had access to personal finance as a coping capacity to absorb the impact of flood disaster. Likewise, majority (72.5%) of the respondents in the suburban zone declared accessibility to personal finance whereas fewer (54.7% and 59.5%) of the respondents in the core and transition zones respectively declared not availability to personal finance. As a result, disparity on the accessibility to personal finance exist in the three zones.

**Table 2** – Households' absorbability coping capacity to the impact of flood disaster

| Parameters  | Developmental Zones |            |            | Total      |
|---|---------------------|------------|------------|------------|
|   | Core                | Transition | Sub-Urban  |            |
| Availability of Infrastructure that can withstand flood |                     |            |            |            |
| Yes   | 71 (39.2)           | 67 (45.2)  | 78 (47.5)  | 216 (43.8) |
| No  | 110 (60.8)          | 81 (54.8)  | 86 (52.5)  | 273 (56.2) |
| Total   | 181 (100)           | 148 (100)  | 164 (100)  | 493 (100)  |
| Infrastructure that can withstand flood                 |                     |            |            |            |
| Drain   | 70 (38.6)           | 30 (20.2)  | 51 (31.0)  | 151 (30.6) |
| Building  | 54 (29.8)           | 77 (52.0)  | 89 (54.2)  | 220 (44.6) |
| Green Spaces  | 57 (31.6)           | 41 (27.8)  | 24 (14.6)  | 122 (24.8) |
| Total   | 181 (100)           | 148 (100)  | 164 (100)  | 493 (100)  |
| Local Knowledge of Early Warning                        |                     |            |            |            |
| Very early  | 42 (23.2)           | 43 (29.0)  | 18 (10.9)  | 103 (20.8) |
| Early   | 95 (52.4)           | 75 (50.6)  | 26 (15.8)  | 196 (39.7) |
| Just in time  | 10 (5.5)            | 13 (8.7)   | 91 (55.4)  | 114 (23.1) |
| Late  | 18 (9.8)            | 14 (9.4)   | 19 (11.5)  | 51 (10.3)  |
| Very late   | 16 (9.1)            | 3 (2.3)    | 10 (6.4)   | 29 (6.1)   |
| Total   | 181 (100)           | 148 (100)  | 164 (100)  | 493 (100)  |
| Access to personal financial resources                  |                     |            |            |            |
| Yes   | 82 (45.3)           | 60 (40.5)  | 119 (72.5) | 261 (52.9) |
| No  | 99 (54.7)           | 88 (59.5)  | 45 (27.5)  | 232 (47.1) |
| Total   | 181 (100)           | 148 (100)  | 164 (100)  | 493 (100)  |
| Note – compiled by the authors                          |                     |            |            |            |

Note – compiled by the authors

*Households' adaptability coping capacity to the impact of flood disaster*

Households' adaptability coping capacity to the impact of flood disaster were examined in the three developmental zones of the study area. To adapt to the impact of flood disaster, households were examined whether they live in an affected house before renovation, change of social and environmental behaviour, access to financial resources to mitigate flood impact and institutional emergency relief materials. This is because households must be able to adapt to the impact of disaster and also continue in their daily activities (Odunsi et al., 2020; Ogundipe, 2024). Therefore, as presented in Table 3, findings were made on the respondents' adaptability coping capacity to the impact of flood disaster in the three developmental zones of Ile-Ife, Nigeria.

Findings revealed that 59.1% of the respondents reside in the affected house before renovation as adaptability coping capacity to the impact of flood disaster. In the core zone, majority (67.4%) of the respondents reside in the affected house before renovation unlike half (52.5%) of the respondents in suburban zone that does not reside in the affected house before renovation. Also, majority (59.1%) of the respondents reside in the affected house before renovation and this is more common in the core and transition zones. Further findings indicated that 52.5% of the respondents in the suburban zones does not reside in the affected house before renovation and this reflects in their income. Therefore, it could be concluded that respondents adapted to the impact of flood disaster by staying in the affected house before renovation



whereas it is a common activity in the core and transition zones.

Furthermore, in the three developmental zones, 37.1% of the respondents claimed to adapt early to the impact of flood disaster by changing social and environmental behaviour in their home. One third, 20% of the respondents also change their social and environmental behaviour very late and the findings were similar in the three zones. Further findings revealed that the period of change of social and environmental behaviour decreases from the core to the transition through suburban zone. Majority (37.1%) which formed one third of the respondents change early to social and environmental behaviour which could enhance households' adaptability to flood disaster in the study area. This suggest that there is low level of adaptation to flood disaster based on the period that respondents adapt to the impact of flood disaster.

To examine the capacity of the respondents to adapt to the impact of flood disaster, findings further indicated that slightly half (52.8%) of the respondents do not have access to financial resources. Although, findings revealed that 44.1% and 40.5% of the respondents in the core and transition zones

had access to financial resources respectively, majority (56.7%) in the suburban zone do not have access to financial resources that could help to adapt to the impact of flood disaster. In all, variation exist in the respondents' accessibility to financial resources as a coping capacity to adapt to flood disaster in the study area.

Finally, in a bid to adapt to the impact of flood disaster, 40.7% of the respondents depends on the government for institutional emergency relief materials across the study area. Likewise, 20.9% of the respondents had their relief materials from non-governmental organizations in order to adapt to the impact of flood disaster. Though, 19.4% and 11.1% of the respondents depends on relatives and friends respectively for relief material, fewer 7.9% depends on church and mosque. As a result, institutional emergency relief materials which could help respondents to adapt to the impact of flood disaster were mostly through government. As a result, government intervention through the provision of institutional emergency relief materials promotes households' adaptability coping capacity to flood disaster in the study area.

**Table 3** – Households' adaptability coping capacity to the impact of flood disaster

| Parameters                                   | Residential Zones |            |           | Total      |
|--|-------------------|------------|-----------|------------|
|  | Core              | Transition | Sub-Urban |            |
| Live in affected house before renovation     |                   |            |           |            |
| Yes  | 122 (67.4)        | 91 (61.4)  | 78 (47.5) | 291 (59.1) |
| No   | 59 (32.6)         | 57 (38.6)  | 86 (52.5) | 202 (40.9) |
| Total  | 181 (100)         | 148 (100)  | 164 (100) | 493 (100)  |
| Change of social and environmental behaviour |                   |            |           |            |
| Very early                                   | 18 (9.9)          | 14 (9.4)   | 20 (12.1) | 52 (10.5)  |
| Early  | 81 (44.7)         | 50 (33.7)  | 52 (31.7) | 183 (37.1) |
| Just in time                                 | 19 (10.4)         | 21 (14.1)  | 22 (13.4) | 62 (12.5)  |
| Late   | 22 (12.1)         | 32 (21.6)  | 40 (24.3) | 94 (19.1)  |
| Very late                                    | 41 (22.9)         | 31 (21.2)  | 30 (18.5) | 102 (20.8) |
| Total  | 181 (100)         | 148 (100)  | 164 (100) | 493(100)   |
| Financial resources to mitigate flood impact |                   |            |           |            |
| Yes  | 80 (44.1)         | 60 (40.5)  | 93 (56.7) | 233 (47.2) |
| No   | 101 (55.9)        | 88 (59.5)  | 71 (43.3) | 260 (52.8) |
| Total  | 181 (100)         | 148 (100)  | 164 (100) | 493 (100)  |

Continuation of the table

| Parameters                               | Residential Zones |            |           | Total      |
|--|-------------------|------------|-----------|------------|
|  | Core              | Transition | Sub-Urban |            |
| Institutional Emergency Relief Materials |                   |            |           |            |
| Relatives                                | 35 (19.3)         | 10 (6.7)   | 51 (31.1) | 96 (19.4)  |
| Friends/Colleagues                       | 21 (11.6)         | 20 (13.5)  | 14 (8.5)  | 55 (11.1)  |
| Church/Mosque                            | 10 (5.5)          | 14 (9.4)   | 15 (9.1)  | 39 (7.9)   |
| Government                               | 65 (35.9)         | 71 (47.9)  | 65 (39.6) | 201 (40.7) |
| NGOs                                     | 50 (27.7)         | 33 (22.5)  | 19 (11.7) | 102 (20.9) |
| Total                                    | 181 (100)         | 148 (100)  | 164 (100) | 493(100)   |
| Note – compiled by the authors           |                   |            |           |            |

## Conclusion

Based on the findings from the study, it can be concluded that absorbability and adaptability coping capacity to flood disaster was with varying degrees in the three developmental zones and this was influenced by socioeconomic characteristics of households' heads. The study recommended that there is a need for government to formulate policies that could mitigate flood disaster. These policies and framework will aid flood disaster management agencies in carrying out pre-disaster management activities such as the identification of flood prone areas and early issuance of warnings to those residing in such areas.

Considering the peculiar situation of most households in the study area, in that they have no one readily available to help in times of distress. As

such, they must fend for themselves in dire situations. This gives importance to having high availability rates of credit facilities and insurance especially in the core zone with low-income residents. The government is in the best position to provide this, as it will ensure that they are obtainable at a reduced cost as opposed to when done by private individuals/corporations.

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## Conflict of Interest

The authors declare no conflict of interest.

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