VULNERABILITY OF SMALL-SCALE FISHERWOMEN TO FLOODING IN OWORONSHOKI AND SHOMOLU FISHING COMMUNITIES IN LAGOS STATE, NIGERIA

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ABSTRACT
The flooding in Nigeria has gained national and global attention with its significant impact on fishing communities. However, there had been no specific reference to ameliorating the hardship being faced by fisherfolk, especially the fisherwomen, who were the most vulnerable to the flooding. Hence, this study examined the vulnerability of small-scale fisherwomen to flooding in Oworonshoki and Shomolu fishing communities. Primary data used for the study was collected with the aid of a semi-structured questionnaire. This was complemented with qualitative data using Key Informant Interviews and Focus Group Discussion. A total sample size of 60 fisherfolk was used. Findings revealed that women who were involved in fishing, shrimping, processing, and trading did not plan to relocate despite flooding experiences because their survival is water-dependent. The flood disrupted routine fishing activities and brought with it pollutants from industrial waste and runoff from canals, causing fish death and income loss. The fisherwomen have devised local means to survive the impact of flooding on their livelihood. The coping strategies engaged by them included not fishing when the water level was high, relocation of smoking kilns, expansion of sources of fish supply beyond their husbands and existing customers, as catches became poor. They organized themselves into groups to meet their needs and obtained loans from microfinance to survive the economic impacts of flooding. The women expressed their desire for the government's support in modernizing their landing sites and providing storage facilities, as well as cash gifts to support their activities.

Keywords: Coping strategies, Coastal communities, Fisherwomen, Industrial waste, Government support
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INTRODUCTION

Climate change effect is a global concern across various disciplines. Flooding is one of the effects of climate change today. It has been reported as the most common natural hazard and the third most damaging globally after storms and earthquakes (Wilby and Keeman, 2012; Areola, 2021). The devastating impact of flooding on aquaculture-based businesses has been a pressing issue in recent times across various forums (Enwa and Achoja, 2023). Flood disasters are said to have increased recently due to climate change, and areas prone to flooding in Nigeria are more affected (Adelekan, 2010; AUNISDR, 2016; Areola and Fakoya, 2020). Nigeria has experienced heavy rains and devastating floods that have caused loss of life, population displacement, and extensive destruction of properties such as houses, farms, and infrastructure (OCHA, 2022). According to news reports, the flooding in Nigeria that year (2022) was the worst on record since 2012 (NASA, 2022). According to UNICEF (2022), as of 24 October 2022, over 1.4 million people have been displaced due to the floods. Over three million people were reported affected in 34 states (out of 36 states) in the worst flooding the country has seen in over a decade, and at least 603 people have died and over 2,400 have been injured since July 2022 (OCHA, 2022).

The fisheries sub-sector is a significant source of fish food and livelihood for many people living in the coastal communities, as it supplies animal protein necessary for growth and income for many households in these rural communities (Akinrotimi *et al.,* 2007; Cliffe and Akinrotimi, 2015). Small-scale fishing activities support coastal communities, and hundreds of millions of people depend on fishing for all or part of their income and food supply (Arthur *et al.,* 2021). More than 95% of the world's fishers are engaged in small-scale and artisanal activities and catch nearly the same number of fish for human consumption as the highly capitalized industrial sector (FAO, 2010; Witbooi *et al.,* 2020).

There is an increasing acknowledgement that climate change threatens the sustainability of fisheries and aqua farming (Aroyehun and Henri-Ukoha, 2021). Although climate change is said to affect everyone, its impact varies across genders. According to Achakpa *et al.* (2019), women and girls, who constitute the largest percentage of the world's poorest people, are the ones who would experience the greatest impact of these changes that they are least responsible for. They often face higher risks and greater burdens from the impacts of climate change in situations of poverty, and due to existing roles, responsibilities, and cultural norms where these women are also responsible for household energy, food, water, and care for the young and elderly (United Nations on Climate Change, 2023). Climate change has been established to have a greater impact on the world's most vulnerable people, and it exacerbates existing inequalities, whether in developed or developing countries (Areola and Fakoya, 2020; Ayanlade *et al.,* 2023).

Vulnerability to climate change is exacerbated by inequity and marginalization linked to gender, ethnicity, low income, and other social and economic factors (United

Nations on Climate Change, 2023). Vulnerability indices also showed women to be more exposed (0.482, and sensitive (0.489) with the least adaptive capacities (0.462) to the climate change and variability impacts in a study on the Livelihood Vulnerability Index: Gender Dimension to Climate Change and Variability in REDD+Piloted Sites, Cross River State, Nigeria (Basiru *et al.,* 2022). The vulnerability of women is further exacerbated by limited access to credit, education, and decision-making power, which can hinder their capacity to adapt (Basiru *et al.,* 2022). The gendered exposure to climate change is generally influenced by occupation, social norms, and access to resources (Basiru *et al.,* 2022).

It has become important to examine how climate change impacts affect women who play vital roles in fishery-related activities around the world, especially in the coastal environment, where these activities are classified mainly in three ways: fishing, processing, and marketing (Olufayo, 2012; Cliffe and Akinrotimi, 2015). Their roles in food production, like in coastal fisheries, have become more relevant as a way of reducing poverty and enhancing food security. The actors along the value chains in the fisheries and aquaculture, in Nigeria, are increasingly affected by devastating flooding due to the inadequacies of weather reporting systems in remote areas of operation, which have left fish farmers and fishermen unprepared and extremely vulnerable to climate change (Areola, 2021). There is an urgency to have more extensive adaptation strategies than the currently available wide array of adaptation options to combat and reduce the vulnerability to future climate change. Adaptive capacity, which is not evenly distributed across and within societies, is intricately connected to social and economic development (UNFCCC, 2011).

The inhabitants of Oworoshoki are low-income earners and suffer from poor sanitation. The community has a waterfront where the locals or inhabitants can go fishing and do other activities. It equally has tourism potential (Okimiji *et al.,* 2021). Shomolu, on the other hand, also faces socioeconomic challenges such as poor sanitation, high population density, inadequate housing, and poverty. The main objective of the study was to examine the vulnerability of small-scale fisherwomen to flooding in Oworonshoki and Shomolu fishing communities in Lagos State, Nigeria. Specifically, the study highlighted the impact of flooding on the activities of coastal women in two communities in Lagos State, Nigeria. It investigated and documented the challenges faced by these women and their coping strategies, as well as the commonalities between the communities. Furthermore, it suggested ways to empower fisherwomen to become less vulnerable to flooding in their business enterprises.

MATERIALS AND METHODS

The study was carried out in Lagos State, Nigeria. It covers communities in two local government areas (Kosofe and Shomolu) in the State; Mosafejo Community in Oworonshoki and Ajayi Olaiya Community in Isale-Akoka, Lagos State, Nigeria. Oworonshoki is pivotal to Lagos State as it connects the mainland and Island areas of Lagos via the Third Mainland Bridge. It also hosts a terminal of the Apapa-Oworonshoki expressway. Latitude of N 6.26 '36; Longitude E 3.19'17.162. Akoka is in the heart of Yaba, Lagos State. The community is located at Latitude 6 degrees 31'14.4264. Longitude 3 degrees 23'7.2276.

Data type and sampling: Primary data were collected through in-person interviews and focus group discussions. Secondary data sources complemented this. The data collection lasted for six months. A qualitative approach was employed for data collection, involving interviews with key informants (fisherwomen), observations, and the use of questionnaires. A multistage sampling procedure was employed in selecting the respondents. In the first stage, two local government areas (LGAs), Kosofe and Shomolu, were randomly selected. In the second stage, there was a purposive selection of one coastal community from each selected LGA with the presence of fisherwomen. The third stage involved random selection of respondents from these two communities based on the size of the community and the population of fisherwomen found there. Forty-two women were randomly selected from Isale-Akoka Community, and 18 women were randomly selected from Oworonshoki Community. Thus, a total sample size of 60 fisherwomen was used for the study.

RESULTS

Socioeconomic Characteristics of Respondents

Results in Table 1 revealed that the average age of the respondents was about 45 years, with most (65%) age falling within the range of 31-50 years. This implies that most of these fisherwomen are still economically active. Their educational status showed that at least more than half (58.3%) of these fisherwomen attained a basic level of education, even though 33.3% of them had no formal education. About 83% of the fisherwomen were married, indicating that youths or single females hardly take up livelihoods in the fishing value chains. The average household size was about 6 persons, with the majority (80%) of them having 4-6 household size.

Table 1: Distribution of respondents by socioeconomic characteristics

Socioeconomics	Frequency	Percentage
Age (years)		
21-30	11	18.33
31-40	8	13.33
41-50	25	41.67
51-60	10	16.67
>60	6	10.00
Mean=45.12; SD=12.73	60	100.0
Educational status		
None	20	33.33
Primary	13	21.67
Secondary	22	36.67
Tertiary	5	8.33
	60	100.0
Marital status		
Single	2	3.33
Married	53	88.33
Widow	5	8.33
	60	100.0
Household size		
1-3	1	1.67
4-6	48	80.00
>6	11	18.33
Mean=5.68; SD=1.32	60	100.0

Source: Author's computation, 2025

Livelihood and Flood Situations

The small-scale fisherwomen, all coastal dwellers, live in the Mosafejo Community, Oworonshoki, and Ajayi Olaiya Community of Isale-Akoka. There are two fishing landing sites in the area: Oworonshoki and Shomolu landing sites. The women spoke Yoruba, Ilaje, and Egun languages. They depended solely on fishing, shrimping, picking of periwinkles, fish processing, and trading (see Figure 1). They were women full of passion for their profession, and they also had domestic responsibilities, such as caring for their children and husbands, since 83% of them were married. The fisherwomen understood flooding as the increase in water levels, which was a result of high tide. The coastal women believed that it was natural to experience flooding annually, but that this year's flooding was greater than ever experienced previously because their homes, shops, kitchens, and processing kilns were submerged by the water (see Figures 2, 3, and 5). They had to wade through water to carry out their daily activities. Similar challenges were observed in both communities. Though there were warnings by the State Government to the fishermen and their families to relocate from these communities, the fisherwomen were adamant about staying back. According to them, this was the only life they knew, and they would not survive outside of the environment.

Figure 1: Women picking or foraging for periwinkles.

Effect of Flooding on Fisherwomen in Coastal Communities

They were no longer able to go fishing, which was usually done at very early hours of the morning before the flooding. The women who were processors could no longer depend on their husbands' catches alone because the catches were poor. They had to seek fish from other landing sites. For those who had few catches, the women fish processors had to hang the wood over smoking kilns to keep it dry and on elevated surfaces from flooding. Their homes were flooded, and they had to elevate their beds using piled-up stones; meanwhile, the use of mats on the floors as sleeping places became impossible. Cooking and processing became practically difficult. Suppliers could not access them due to flooding on the road. This results in a loss of income and waste. During the flood, chemicals, and canal or drainage discharge mix with the water, making the fish spoil easily. The floods brought pollutants and weeds, such as water hyacinth, which prevented the fisherwomen from fishing. This limited their maximum utilization of the water body area, and therefore, catching high numbers of fish became difficult.

Figure 1: The women are fishing for periwinkles

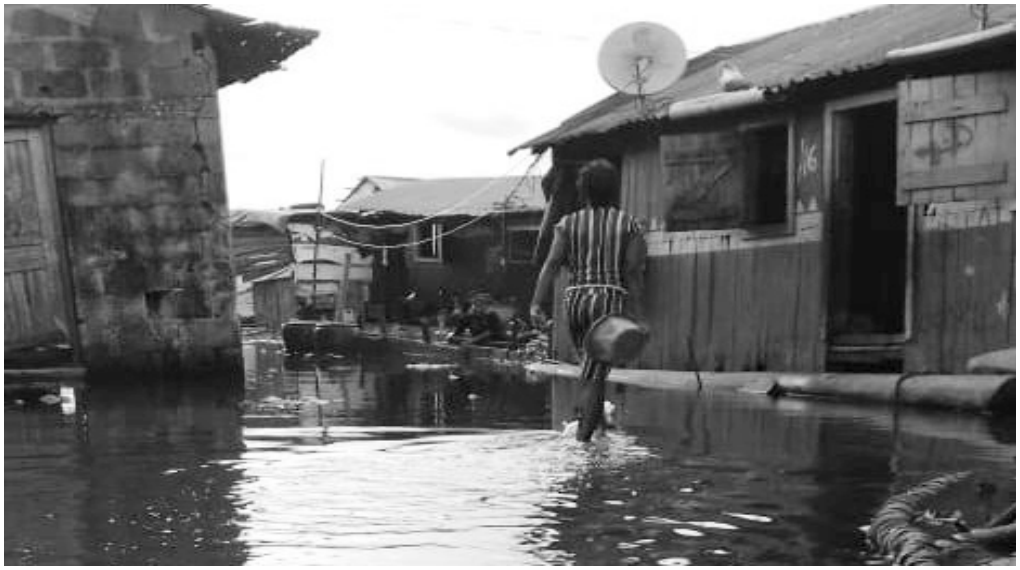

Figure 2: Picture of communities submerged in water taken during the survey. This is Oworonshoki, one of the study areas, with a woman wading through the waters to get into her home.

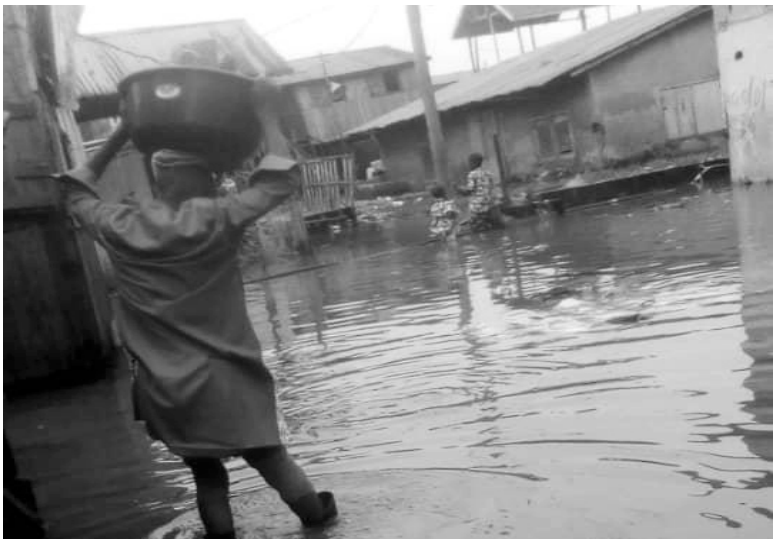

Figure 3: Pictures of communities submerged in water taken during the survey. This is the second study area, which is the Isale-Akoka Community.

Figure 4: Picture of the water hyacinth brought in by flooding.

Coping Strategies or Innovations by Fisherwomen to Flooding Challenges

The women are resolute in their determination to survive and overcome whatever challenges they face now or may come up. The fisherwomen organized themselves into groups as a coping mechanism, supporting themselves in various ways to meet their needs. Only three of these groups have been recognized and registered by the Lagos State Government as cooperative societies which are Ifelodun Processors Association at Isale Akoka, Abo Oja Processors Association and Ajewole Processors Association. Others not yet registered included the Adun Ola Smoking Fish Association, Imodoye Processors Association, and Yonnugbele Ago Egun Association.

Since they had mastered the movement of the flood waters, the fisherwomen suspended fishing for the period of flooding and engaged in other types of occupations as an alternative means of livelihood. For shrimping, the fisherwomen go to the lagoon in the early hours of the morning before the water level rises. In foraging for periwinkles, the women used tall buckets to lift themselves above the water level, so they were not submerged when picking the periwinkles. The processors moved their smoking drums to higher levels, covering them from the incessant rain and must usually wait for the water level to reduce before processing activities.

The communities were cut off during flooding. Hence, wooden bridges were constructed across the floodwater to facilitate movement within the communities and to carry out their daily chores. The women carried their products - smoked fish, periwinkles, and shrimps to customers at distances far from their homes, where there was no flooding to maintain the flow of income. Some areas were sand-filled to elevate the ground levels and make living conditions more conducive and comfortable. This was done through community effort. To survive and still meet their responsibilities as financial contributors in their homes, the women became buyers of fish and fishery products from other landing sites, not adversely affected by flooding. In addition, they obtained loans from two microfinance banks named Lapo Micro-Finance Bank and Grooming Micro-Finance Bank. They were sometimes forced to collect loans (*owo ele*), which was money collected from individual creditors at very High interest rates to increase their buying capacities during the period.

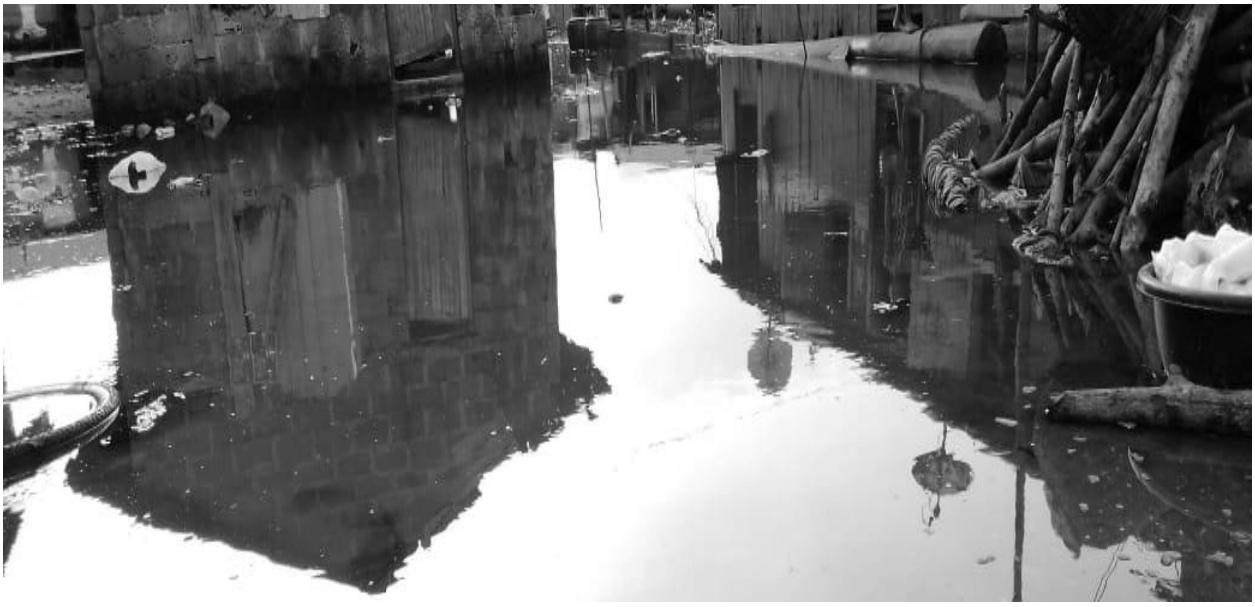

Figure 5: Picture of a community submerged in water taken during the survey. The women packed the firewood for smoking on raised surfaces away from the flood water.

Figure 6: Picture showing where firewood is hung to avoid disruption in fish smoking due to flooding.

DISCUSSION

Their average age is supported by the findings of Olopade *et al.* (2017), who reported an average age of 36 years for fisherfolks in brackish and coastal waters in Lagos State. The flooding brought with it pollutants from industrial wastes and runoffs from canals that had been clogged with wastes, which led to the pollution of the water and fish deaths. These findings conform to the reported environmental problems caused by industrialization, contaminating water, and putting the lives of fish at risk (Ekubo and Abowei, 2011). Fishing activities were paralyzed as fishermen could not go fishing due to the risks involved. This conforms with the findings of Oyekale *et al.* (2022), who reported that the economic activities of fisherfolks were usually disrupted during flooding. In addition, Badjeck *et al.* (2013) reported that while direct impacts of climate change on fishing communities included destruction of gear, infrastructure and productive assets (boats, landing sites, and post-harvesting facilities), indirect impacts included disruption to markets and through reducing harvesting capacity and access to markets, food supply and employment. All the coping strategies employed against flooding by the women fisherfolks were unique from what was reported by Adeoti *et al.* (2011) who found that fishing households in Lagos State coped with flooding by using strategies such as relocation of settlements to another place at the household level, movement to another fishing site, and financial support at the community. To address the vulnerabilities specifically faced by women is imperative because their contributions are critical to make food systems more resilient to the negative impacts of climate change, because of their specialized knowledge, skills, and role in agri-food systems within the household, at work, and in their communities Bryan *et al,* (2023).

CONCLUSION

The women were coastal dwellers, and their lives, livelihoods, and survival depended on water. Fishing activities were paralyzed as fishermen could not go fishing due to the risks involved. Catches became inaccessible during flooding, and customers were unable to access them, which affected their income and resulted in waste. During the flood, chemicals and canal or drainage discharge mixed with the water, making the fish spoil easily. They also made use of other landing sites. The coping strategies engaged by the fisherwomen included not fishing when the water level was high, relocation of smoking kilns, expanding the supply of fish beyond their husbands and existing customers as catches became poor, organizing themselves into groups to meet their needs, and obtaining loans from microfinance to survive the economic impact of flooding. The women fish processors had to hang the wood over smoking kilns to keep it dry and on elevated surfaces to prevent flooding. These experiences confirm that the fisherwomen in Oworonshoki and Shomolu were vulnerable to flooding, which directly impacted their viability.

It is therefore recommended that the basic minimum facilities should be provided to women to help them cope with their occupations and domestic chores during flooding. The government needs to assist them in the construction of landing sites with modern facilities that will prevent incursions of floodwater, improve drainage, and enhance road networks. The government should extend the same position to men, making it mandatory for all women in small-scale fisheries to be registered in a cooperative society under the Ministry of Commerce and Cooperative, Lagos State. This will ensure that they can easily access credit facilities and input supplies. Fisherwomen require government intervention for essential inputs, including strong and modern fishing boats, storage facilities for catch preservation, modern smoking kilns, and improved living conditions. They (fisherwomen) must be empowered with coping adaptation strategies to flooding in terms of information, preparedness, and exposure to alternative means of livelihood during flooding. It is by tackling climate change with a gender lens that women's rights can be addressed and greater gender equality promoted. This is because investing in gender equality and women's empowerment has far-reaching benefits.

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AUTHORS CONTRIBUTION

AFO was involved in the design of the work and questionnaire, interviews, photography, community visits, completion of questionnaires, data collection, data compilation, desk review, analysis, and manuscript draft. SLA and KF supervised the entire project from the design of the questionnaire to the reviews of the draft and approval. BO was involved in community visits, completion of questionnaires, and data collection. OIO was involved in the design of the questionnaire, desk review, and manuscript draft. All authors approved the manuscript for submission.

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