

Flood Disasters and the Threat to Food Security in Benue State

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Abstract

Food is a primary need of humans and food security is central to the sustainability of livelihoods of people. Over the years the Federal and State Governments in Nigeria have been striving to meet the local food needs of its growing population without appreciable success. There is a growing concern that climate change, manifest through increased rainfall and attendant floods, will further affect the capacity of the nation to meet the food demands of its people. This paper looks at flood disasters and their impact on the various dimensions/ components of food security in Benue State. Data was sourced via the questionnaire (christened the Food Security Indicator) which was administered to 390 respondents who were randomly selected from six communities in three L.G.As, from the Benue Northwest senatorial zone. The data collected from the field was analyzed using the frequencies and percentages. Findings reveal that majority of respondents perceived that flooding affects food availability, access and utilization. The findings however reveal that flooding does not impact on food stability; as this is likely to be a function of other factors. In view of this, it was recommended that Government and Development Partners should make sustainable arrangements to provide buffer stock of food to cushion the effect of flood hazards on food challenges of households. Government should also device ways of harvesting flood waters that will help boost dry season farming thereby increasing food production.

Keywords: Flood Disasters; Flood-Prone Areas, Food Security, Dimensions of Food Security, Benue.

Introduction

Food is a primary need of humans and food security is central to the sustainability of livelihoods of people. Food security is a state of having reliable access to a sufficient quantity of affordable and nutritious food (Adebayo, 2023, p. 67). It is critical to building and sustaining a healthy economy and achieving social and environmental wellness (Fanzo, 2019, p.163). Food security is an issue of global importance that all nations must strive towards achieving (Osabohien et al., 2018, p.158). Consequently, there have been several global partnerships and initiatives, most notably by the United Nations, targeted towards achieving food security. Unfortunately, most of these initiatives have not yielded the desired results as a large number of people remain hungry and malnourished.

Food insecurity is a long-standing problem in Nigeria. Successive Governments have struggled unsuccessfully to meet the local food needs of its growing population. It is

reported that 7 out of 10 Nigerians do not have adequate food to eat (World Economic Forum, 2022). The country's demand for food far outstrips its production levels. Nigeria still relies heavily on food imports, spending about 10 billion US dollars annually, to meet its food and agricultural production shortfalls (World Economic Forum, 2022).

There is a growing concern that climate change will further affect the capacity of many nations, particularly those in Africa, to meet their food demands. In Nigeria, the impact of Climate change particularly on precipitation patterns have resulted in increased severity and rate of occurrence of floods, the worst experience in recent history been the floods of 2012; 363 people were reported to have died, while more than 2.3 million people were displaced, and 16 million people were impacted (Echendu, 2020a). Afterwards, flooding in the country has appeared to become almost a yearly phenomenon. Where flood events might be increasing or shifting in seasonality or character, their impact on agriculture and food security should be an issue of interest and concern to everyone, particularly the academic community and policy makers (Nka et al. 2015, p.4710). Many studies have looked at the impact of flooding on food security (Idoko, 2016; Achoja et al., 2019; Sadiq et al., 2019; Jonathan et al., 2020). However, there is a dearth of research that pays particular attention at the impact of flooding on the various components of food security that compositely address the problem. This highlights a gap which this study seeks to fill.

Statement of the Problem

Flooding has become a serious and very devastating environmental problem in Benue State. Iortyer & Yio (2023, p.319), reports that the entire Benue valley has experienced severe flooding in the last two decades, causing destruction to farm lands and crops particularly in food-producing communities along the banks of river Benue, consequently posing a serious threat to food security. Food security is a complex phenomenon which is viewed as an integration of four core dimensions: availability, access, utilization and stability (Echendu, 2022, p.2), all of which must be meet at all times for a community or nation to be deemed food secure.

A number of studies have been carried to investigate the impact of flooding on food security in Benue State. Jiriko, Mbah & Amah (2020, p.61), examined the impact of flooding on food security but restricted their efforts to understanding the causes of floods and their impact on farmlands. Iortyer & Yio, (2023, p.320), also examined the effect of flooding on food security as it affects household's income, as well as the prices of agricultural products. This study extends the literature; the paper assesses the impact of flood disaster on the various dimensions/components of food security of farming communities in Benue State. The aim is to ascertain whether or not flooding affects all the dimensions of food security in the study area.

Research Question

This study will attempt to answer to the question below:

- i. What is the impact of flooding on the various dimensions of food security?

Conceptualizing the Flooding and Food Security Nexus

Food security has been variously defined. United Nations (2023) defined food security as the availability of adequate world food supplies of basic foodstuffs at all times to sustain a steady expansion of food consumption and to offset fluctuations in production and prices. Food security is also defined as a situation where all people, at all times, have physical, social, and economic access to sufficient, safe, and nutritious food that meets their food preferences and dietary needs for an active and healthy life (IFPRI, 2024). To Robertson (1990), Food security includes consuming food at a level adequate for physical and mental health and also includes the right cultural preferences.

These definitions show that food is not only a basic need; it also provides the physiological foundation upon which other considerations and human activities are structured. It is not just about having sufficient and adequate quantities of staple foodstuffs but it also entails access to these food items at affordable prices (Eme, Onyishi, Uche & Uche, 2014, p.5).

The concept of food security encompasses four key components: availability, access, utilization, and stability of food (Echendu, 2022, p.4). Availability is achieved if adequate food is available at people's disposal. Access is ensured when all households and all individuals within those households have sufficient resources to obtain appropriate foods for a nutritious diet. Adequate utilization is the ability of the human body to ingest and metabolize food. In most cases, utilization is only discussed from a biological perspective (FAO, 2014). Food utilization is the most important but least researched aspect of food security due to its complexity (Zewdie 2014, p.226). Food stability is a situation where all the three components above are sustained over a period of time.

Flooding impacts all the components of food security either directly or indirectly. Flood can cause financial loss to producers, suppliers, and consumers of food production which could reduce individuals' capacity to afford food in communities (Pacetti et al., 2017, p.496). The inability to afford food can reduce the ability to access and utilize food items with the required nutritional values for individual. Floods also damage the ability to store food products to make food available to individuals and communities. Food stability hinges on the ability to maintain availability, access, and utility of food items in localities.

Materials and Methods

Study Area

Benue State is situated within the middle belt of Nigeria, located between longitudes 6°33'E and 10°E and latitudes 6°30' N and 8°10'N, and occupies a land mass of about 33,955 square kilometers with a population of 5,189,138 (2014 projection). The State has 23 local

Government Areas with its headquarters in Makurdi. The state is administratively divided into three zones namely; Zone A (North Eastern Zone), Zone B (North Western Zone) and Zone C (Southern Zone).

The major occupation of the people of Benue State is farming. The state is regarded as the 'food basket of the nation' owing largely to its endowment with rich fertile lands and favorable climatic conditions suitable for agricultural production (Ani et al., 2024, p.313).

The state boasts of the widest array of agricultural products such as yam, rice, maize, sorghum, millet, groundnuts, soya beans, sweet potatoes and abundant vegetables and fruits. Many indigenes are into the business of rearing birds and animals.

The State lies within the Koppen's Aw climate and experiences two distinct seasons: the wet and the dry seasons. The wet season begins in April and ends in November while the dry season starts in December and ends in March. In terms of water resources, the State has the second largest river in the country (i.e., River Benue, where the state derived its name) traversing it. Other smaller rivers draining the landscape of Benue include Katsina-Ala, Buruku, Aya, Be, Mu, Amile, Konshisha, Okpokwu, Agatu, and Apa amongst others. The flood plains which are characterized by extensive swamps and ponds are good for dry season irrigation farming.

Sampling Procedure

The population of the study comprised head of households of farm families in Benue state, Nigeria. The Northwest Senatorial Zone was purposively selected for this study out of the three zones because of persistent occurrence of flood in the area. Three local government areas were selected out of eight local government areas. These L.G.As areas are Buruku, Guma and Makurdi; being the LGAs worst hit during all the flood disasters that have affected the state. The selected L.G.As has a combined population of 1,011,700 (www.citypopulation.com). Two communities were purposively selected from each L.G.A considering their proximity to river Benue and the nature of livelihoods within those communities. The sample size for this study was determined using Slovin's formula stated thus: $n = N / (1 + N * e^2)$; where n =sample size; N = total population; e =error size. The sample size was therefore determined to be 386.

Method of Data Collection

The instrument used for data collection was the questionnaire, christened the Food Security Indicator (FSI), previously employed by Week and Wizer (2020, p.4). It was adopted and modified by the authors to elicit information from respondents. The instrument contained twenty (20) items which are indicators of the effect of floods on the various dimensions/components of food security.

Based on the sample size for the study, 390 respondents (mainly household heads) were randomly selected for questionnaire administration in the three sampled L.G.As. One

hundred and thirty (130) households, sixty-five each from the two sampled communities in each LGA were systematically selected.

Method Data Analysis

The study adopted a 4-point Likert scale format interpreted and assigned values as follows: Strongly Agree (SA) - 4, Agree (A) - 3, Disagree (DA) - 2, Strongly Disagree (SDA) -1. Only 360 of the 390 questionnaires sent to the field were retrieved. The data collected for the study were analyzed using frequency counts and percentages.

Presentation and Discussion of Results

Impact of Flood Disaster on Food Availability

Food availability refers to the availability of sufficient amounts of food. This is dependent on sufficient production levels that can only be guaranteed by a healthy, disaster-free environment (Gil et al. 2019, p.686). This section examines the effect of flood disasters on food availability in flood prone areas. From table 1, the results show that 73% of respondents agreed that most communities faced food shortages occasioned by the washing away of farmland by floods. However, 27% of the respondents disagreed. This aligns with the findings of Week and Wizer (2020, p. 9), where they established that flood increased the issue of inadequate or insufficient food in communities in the Niger Delta. Findings further show that 79.2% of the respondents agreed that most farmers experienced very poor harvest after the floods, while 20.8% of respondents disagreed with this position. According to Ardo (2021, p.61), a farmer whose production fails is forced to resort to other casual sources of income to augment family members' welfare. The result equally depicts that 65.5% of respondents affirmed that floods led to loss of nutritional status of crops cultivated, while 35.5% disagreed with this assertion. It is believed as demonstrated by majority (69.2%) of the respondents flood has pushed farmers to harvest their crops prematurely, leading to hunger in the community.

Table 1. Impact of Flooding on Food Availability.

		SA	A	DA	SDA	Total
The washing away of farmlands during floods led to chronic food shortages in our community.	F	192	71	58	39	360
	%	53.3	19.7	16.1	10.9	100%
Flooding led to the erosion or loss of the nutritional status of crops planted in the community	F	154	82	68	56	360
	%	42.7	22.8	18.9	15.6	100%
Deposition of sediments by floods render some farmlands unsuitable for food production	F	203	92	35	30	360
	%	56.4	25.6	9.7	8.3	100%

Table 1. Contd.

Farmers in our community experienced very poor harvest of crops after flood incidents	F	184	101	59	16	360
	%	51.1	28.1	16.4	4.4	100%
Flood destroyed aquaculture and fish farms	F	104	134	70	52	360
	%	28.8	37.4	19.4	14.4	100%
Flood caused stunted crop growth and low food production in our community	F	131	101	50	78	360
	%	36.6	28	13.8	21.6	100%
Flood increased the absorption of essential nutrients necessary for plant growth	F	59	62	121	118	360
	%	16.4	17.3	33.6	32.7	100%
Flood triggered the harvesting of immature crops leading to hunger in the community	F	141	108	64	47	360
	%	39.1	30.1	17.7	13.1	100%

Source: Authors' fieldwork, 2024

Majority of the respondents (82%) agreed that the deposition of sediments by floods renders some farmlands unsuitable for crop production; 66.2% of respondents affirmed that flood destroyed aquaculture and fish farms. The results above clearly show that when flood occurs, it impedes the availability of food for people residing in flood prone communities.

Impact of Flood Disaster of Food Accessibility

Food accessibility is the ability to secure or obtain sufficient nutritious food as determined by purchasing power and affordability (Echendu, 2022, p.8). This section assesses the impact of flood on food access in flood prone communities in Benue State. The results as presented in table 2 show that majority (66.1%) of respondents affirmed that flood increased the unavailability of staple foods leading to malnutrition and hunger in most communities. For this reason, 65% of the respondents agreed that about three months after the flood, they were taking insufficient food that didn't meet their dietary requirements; 35% of the respondents however felt otherwise. The results also show that 65.1% of respondents agreed that flood destroyed food in stored reserves and on cultivated lands; this impacted negatively on farmer's income and purchasing power as affirmed by 69.1% of respondents. This resonates with the finding of Jiriko, Mbah & Amah (2020, p.62), where it was found that flood destroyed grains in stored reserves worth Thousands of naira.

Table 2. Impact of flooding on food accessibility

		SA	A	DA	SDA	Total
There was increased unavailability of staple foods leading to malnutrition and hunger after the last flood.	F	114	124	51	71	360
	%	31.6	34.5	14.2	19.7	100%
Floods decreased farmers income and purchasing power	F	128	121	48	63	360
	%	35.5	33.6	13.4	17.5	100%
Flood destroyed food in stored reserves	F	108	126	70	56	360
	%	30.1	35	19.4	15.5	100%
Flood destroyed already weak transport infrastructure and road network required to transport food	F	172	109	59	20	360
	%	47.7	30.2	16.5	5.6	100%
Cost of seedlings increased after every flood event	F	126	113	74	47	360
	%	35	31.3	20.5	13.2	100%
Food prices increased after floods due to limited food supply	F	193	97	40	30	360
	%	53.6	26.9	11.2	8.3	100%
Flood made people to continuously take insufficient food that does not meet the dietary requirements	F	124	110	76	50	360
	%	34.5	30.5	21.2	13.8	100%

Source: Authors' fieldwork, 2024

Results also show that 77.9% of respondents agreed that flood destroyed road networks and bridges required to transport food to other communities for sale. Osabohien et al. (2018, p. 160), reports that most rural communities in Nigeria have been affected by this phenomenon; these communities are isolated making it difficult for farmers to access the needed inputs and markets for their goods. Overall, the results indicate that flooding has impacted negatively on food accessibility in the sampled communities.

Impact of Flood Disaster on Food Utilization

Food utilization is the ability of the body to absorb the needed nutrients from food (Pacetti et al., 2015). The major consideration is that the food should be safe and of high quality. This section carried out an assessment of flood disaster on food utilization in communities in Benue State. The result as presented in table 3 reveals that 71.1% of respondents agreed that flood affected the yield and nutritional quality of food consumed in most flood prone communities in Benue State. About 68% of respondents agreed that flood compare farmers to grow flood resistant crops that have less nutritional value. The results reveal that 58.6% of respondents agreed that the washing away of farmlands by flood reduced the probability of farmers producing and eating healthy foods, while 41.4% of the respondents disagreed with this position. The result also shows that 42.2% of respondents agreed that flood

increase the development of bacterial and fungal diseases that impact on crop quality, while majority (57.8%) of the respondents disagreed with this assertion.

Table 3. Impact of Flooding on Food Utilization

		SA	A	DA	SDA	Total
The washing away of farmlands reduced the probability of producing and eating healthy foods	F	112	99	80	69	360
	%	31.1	27.5	22.2	19.2	100%
Floods affected yield and nutritional quality of food in our community	F	154	102	64	40	360
	%	42.7	28.4	17.7	11.2	100%
Flood increased development of bacterial and fungal diseases that impact on crop quality	F	91	61	112	96	360
	%	25.3	16.9	31.2	26.6	100%
Flood has compared some farmers to grow flood resistant crops of less nutritional value	F	139	106	65	50	360
	%	38.6	29.4	18.2	13.8	100%

Source: Authors' fieldwork, 2024

Impact of Flooding on Food Stability

Food stability is a state of adequate and sustainable availability, access, and utilization of food (Matemilola, 2017, p.5). This implies that the availability of food is not affected by any shocks that might affect food production and supply at all times (Akinyele, 2009). The impact of flooding on food stability was assessed in this section. The results as presented in table 4 shows that majority (61.4%) of respondents disagreed that the continuous fall in farmer's income in the last five years can be attributed to the impact of flooding on communities, while 38.6% of respondents agreed. This clearly indicates that farmer's income in the sampled communities was affected by other factors and not necessarily flooding. For instance, Onwunyi & Anekwe (2020, p.2638), noted that Herders and Farmers clashes has had a negative effect on food production and farmers income in Benue State. The results also reveal that 32% of respondents agreed, while 68% disagreed that people residing in flood prone communities eat food of low nutritional quality long after the communities are hit by flood.

Table 4. Impact of Flood Disaster on Food Stability

		SA	A	DA	SDA	Total
The continuous rise in prices of food products can be attributed to the effects of the last floods	F	91	51	104	114	360
	%	25.3	14.2	28.8	31.7	100%
Farmers still experience poor harvest long after the last floods	F	47	36	123	154	360
	%	13.1	10	34.2	42.7	100%
Food production in our community has continued to decrease long after the flood	F	59	62	121	118	360
	%	16.4	17.2	33.6	32.8	100%
The continuous fall in farmer's income for the last five years can be attributed to the impact of flooding on communities.	F	72	67	134	87	360
	%	20	18.6	37.2	24.2	100%
Our community still faces difficulty in transporting food to the market since the flood destroyed our bridge/roads	F	144	112	64	40	360
	%	40	31.1	17.8	11.1	100%
Our people still eat food of low nutritional quality long after the flood	F	60	55	130	115	360
	%	16.7	15.3	36.1	31.9	100%

Source: Authors' fieldwork, 2024.

The results further show that 76.9% and 23.1% of respondents disagreed and agreed respectively that farmers still experience poor harvest long after their community was hit by floods. Findings of the study also revealed that 71.1% affirmed that their community still faces connectivity problems; they still face difficulty in transporting food to neighboring markets; 28.9% of the respondent however disagreed with this assertion. Another finding shows that 60.5% of respondents disagreed that the continuous rise prices of food items was to be attributed to the effect of flooding on communities, while 39.5% of respondents agreed. It can be inferred from the results presented that flooding does not affect food stability. This is because majority of the respondents disagreed with the indicators used to examine the impact of flood on food stability.

Conclusion and Recommendations

The study has shown that there is food insecurity in Benue State. The study further reveals that flooding has impact on the various components/dimensions of food security. Specifically, the study has shown that flood in last couple of years has impacted on food availability, access and utilization in the sampled communities. The study has however shown that flood has not impacted on food stability; this is influenced by other factors. The paper concludes that there is food insecurity in Benue State. The study therefore recommends that:

- i. Government and the relevant stakeholders should disseminate weather information to enable the farmers take informed decisions to help cope with flood disaster.
- ii. There should be a sustainable arrangement by Government and development partners to provide buffer stock of food to cushion the effect of flood hazards on food challenges of households.
- iii. Government should also device ways of harvesting flood waters that will help boost dry season farming thereby increasing food production.

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