Flooding and Food Security in Anambra State, Nigeria: A Study of the Anambra West Local Government Area

[1]Onyebuchi Johnpaul NDUBA, [2]Jude Chukwuemeka OKAFOR, [3]Ikedi, O. AMAECHINA, [3]Ogonna E. CHUKWUMA
Department of Political Science, Nnamdi Azikiwe University Awka, Anambra State-Nigeria
jo.nduba@unizik.edu.ng, ud.okafor@unizik.edu.ng, io.amaechina@unizik.edu.ng,
oe.chukwuma@unizik.edu.ng,

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Abstract
Perturbed by the economic challenges bedeviling the country in general and Anambra State in particular, especially as regards the agricultural sector, this paper interrogated the concept of flooding, its causes and specifically the effect it has on food security in Anambra State using Anambra West Local Government Area as a case in point. The study was guided by three specific objectives, thus to; examine how flooding has affected food security in Anambra State; determine the impact of flooding on environmental management of Anambra State and; ascertain the level to which the government has responded to the incidence of flooding in Anambra State. Adopting Structural-Functional Theory as its theoretical framework, the study employed thematic analysis in analyzing data sourced from the secondary sources of data generation. The findings of the study showed that flooding has adversely affected food security in Anambra State. Furthermore, the study reveals that flooding has impacted negatively on the environmental management of Anambra State. Finally, the study indicates that the state government has responded positively to the incidences of flooding in the state. It is against this backdrop that the study recommends inter-alia that there is urgent need for all actors and stakeholders to take steps to reduce to the barest minimum the adverse effects of flooding. Some of these steps include irrigation farming which encourages all-year-round and off-season planting; provision of necessary amenities to avail farmers the opportunities to store well their agricultural products as well as adequate means for supply. Furthermore, it is paramount for the local government and state government, in partnership with the federal government to initiate far reaching policy measures to minimize the effects flooding has on the environment.

Keywords: *Flooding, Food Security, Sustainable Development, Environmental Management*

INTRODUCTION

Temporary or continuous flooding is common throughout the world, with about 72% of the earth's surface covered by submerged soils or sediments (Ponnamperuma, 2022). Flooding causes a large scale destruction leading to massive socioeconomic and environmental damages to human lives, structure, properties and the farm lands, thereby inflicting suffering on the communities or areas affected.

This disastrous environmental degradation called flooding hampers development of food security and growth. Periodic flooding occurs in riverine areas like most of the communities located in Anambra West Local Government Area.Flood are natural phenomenon but they become a cause for serious concern when they exceed the coping capacity of affected communities, destroying lines and damaging properties. It affect settlements of all type, from small village and mid-size market towns like those in Mmiata, Ezi Anambra, Umueze Anam and so on.

Flooding is a general temporal condition of partial or complete mundation of normally dry areas from overflows of inland or tidal waters or from unusual and rapid accumulation of runoff (Jeb& Aggarwal, 2008).As result of this flooding, achieving food security in its totality continues to be a challenge not only for these communities but for the whole state. Thus it in turn jeopardizes the lives of many in these vulnerable communities to undergo unnecessary malnutrition, hunger, poverty and deaths. In line with the desire of the state to be sufficient in agriculture, flooding constitutes a serious road block if not properly checked by the government.

According to Kata (1996) the easiest way to observe food security is to examine its absence, which is the persistence of hunger in its many guises. Food security is the function of agricultural production which may be constrained by physical, biological, economic and environmental factors. Food is no doubt, the most basic of all human needs and without it man will die of starvation.

These communities in Anambra West Local Government area like most area in Anambra State in particular as well as Nigeria in general are faced with problems such as low quality of food, erratic supply of food supply, settlement problem, poor and lack of facilities for storage and preservation of food etc. which are caused by disastrous flooding (Opeyemi, 2019).

Flooding in communities such as Umueze Anam, Mmiata etc. in Anambra West Local Government causes great devastation, economic damages, and food insecurity and even in most time loss of lives. Over the years, serious flooding had occurred in these communities most especially the 2012 flooding issues which reaching almost all parts of Nigeria. Therefore , there is need to be prepared to respond to this issues of flood as to protect not just human lives but also food during its emergency in the future.

This study focused on different types of flooding particularly rainfall-induced flood, its cause and ways of mitigating them. It also looked into the menace of food insecurity caused by this natural disaster called flooding and strategies which can help to facilitate food security in these

communities.

Statement of the Problem

There are various challenges confronting Nigeria as a state in her drive for rapid and sustainable development. Some of these challenges include sand-storms, drought and desertification in the Northern region, oil spillage in the South South geopolitical zone as well as flooding, erosion and landslides in the South East zone. Undoubtedly, flooding is one of the most serious environmental problems in Nigeria especially in the South East geo political zone in general and Anambra state in particular. Indeed, it is an environmental problem that had adverse effect on the people in the society. The problem of flooding is due to sea level rise and rainfall runoffs constitutes a significant source of threat to life, property, livelihood, food security, infrastructures in these riverine communities of these local governments. Most of these communities affected are agricultural based area which serve as a source of economic activity.

These problems which are faced by these local governments are migration of people, destruction of household properties, destruction of farm produce thereby causing food insecurity which in turn leads to hunger, malnutrition, spread of communicable diseases and water born disease, pollutions both by air and land, bad road network etc.It is against these backdrop, that we raise the following research objectives that guided the study.

Objectives of the Study

The broad objective of this study is to interrogate the effects of flooding on food security in Nigeria using Anambra State as a case in point. In line with the problem of the study, three specific research objectives were raised. They are to:

1. Examine how flooding has affected food security in Anambra State.
2. Determine the impact of flooding on environmental management of Anambra state.
3. Ascertain the level to which the government has responded to the incidence of flooding in Anambra State.

Significance of the Study

This study has both theoretical and practical significance. The theoretical significance lies on the fact that the study is beneficial to scholars and students in Political Science, Public Administration, Sociology/Anthropology and related disciplines who have a thing or two to do with the key terms in the work. Furthermore, the study will be of immense benefit as it will add to the body of existing literature on the topic.

Practically, this study will serve as an eye opener on the destructive nature of flooding and the menace of food insecurity to the policy makers, government officials, rural planners etc. on the need for an effective approach which will solve the menace of this food insecurity caused by flooding not just to the study area but other town and village that are prone to flooding.

Methodology

The study adopted qualitative research design as it best serves to interrogate the purpose of the study. The study utilized the documentary method to collate data from the secondary sources of data generation, comprising institutional documents from the United Nations, government publications, academic journals, books among others. The data sourced were thematically analysed.

Theoretical Framework

The theory which is best suited in spite of knowing that there are other theories in line with the study topic is structural-functional theory. Thus is because if the structure involve for mitigating the runoff of water is well functioning, flooding could have been averted and food will be secured.

According to Ernest Nagel, he said that structural functional analysis is the combination or contributions of some element in a system to the maintenance of system in a given state. Thus theory is the brainchild of system analysis.

The basic assumptions of structural functional theory are;

1) It takes the society as a single, interconnected system, each element of which performs a specific function. The basic feature of such a system is the interaction of its components for the maintenance of its equilibrium.
   As Hempel say 'the kind of phenomenon that a functional analysis is involved to explain is typically some recurrent activity or some behavior pattern in an individual or a group. And the principle objective of the analysis is to exhibits the contributions which the behavior pattern makes to the preservation or development of the individual or the group in which it occurs. This functional analysis seek to understand a behavior pattern or a sociocultural institution in terms of the role it plays in keeping the giving system in proper working order and thus maintaining it as a going concern'.
2) If society is a system as a whole, it had it'd parts that are interrelated. This parts are structure and each structure has a specific function. If a part are deviated, it result to tension to the whole system.
3) Underlying the whole social structure there are broad aims and principle that are observed by the members of the society.

In this theory, while functions deals with the consequences involving objective as well as processes of the patterns of action , structures refers to those arrangement within the system which performs the function. A single function may be fulfilled by a complex combination of structures, just as any given structural arrangement may perform function which might have different kinds of consequences for the structure.

This structural functional theory was made relevant with scholars like Marion Levy, Merton, Parson, Apter, Easton, Almond and Kaplan etc. For Levy, it is seen from the angle of a unit to the elaboration of its setting. According to him, the basic requisites of structural functional

analysis may be put as:

> One must define the unit for the purpose. The unit must be something in terms of which operations (or processes) can or do to take place. The choice of unit will depend on the problem to which the analysis is addressed.

One must discover (at least by hypothesis) the factors setting the most general limits of possible variation for the types of units chosen. For any human society, the most general limiting factors are human heredity and the non-human environment.

One must try to determine what general types of conditions must be met if the unit is to persist and defined within these limits.One must then determine what pattern must be present if operation in terms of then is to result in the production of the functional requisites.

Talcott Parsons concept of structural functional theory relates to the concept of a system, to subsystem of a society, pattern variables and notion of change. He argued the parts in a society are to be understand only in the context of the whole. It is the whole which is important and this whole according to him is a system. Parson concern is to analyze society and system of functionally interrelated variable and a system as an ongoing set of recurrent and inter-related social actions. As he said, "The most essential condition of successful dynamic analysis is continual and systematic reference of every problem to the state of the system as a whole. Functional significance in this context is inherently teleological.

Parson went further in highlighting set of five basic variable that actors have to confront in any social situation. These are;
Adaptation: This is the capacity of the system to meet the demand of the actors must be increased. It is concerned with the relationship between the social system and its non-human environment-relationship that lead to the supplying of disposable resources which can be used as means to realize the goals of the system as a whole or the goals of any of its subunit.

Goal Attainment: It means the coordinate actions of collectively and the units to bring about desired relations between the system and its environment to move towards the goal set by the system for itself.

Pattern Maintenance and Tension Management: It refer to the uploading of the basic principles of the system with regard to both the value of such pattern and the commitment of the system units to them. Three premises are involved, first that major value must be passed on from one generation to another and it may be called acculturation process. Secondly a social control process is concerned with the application of sanction for violation of the prescription of the value system.Thirdly, a tension management process attempts to prevent the development of situations that increase the probability that large number of actors will violate basic norms.

Integration: It is concerned with the adjustment of relations between and among the units of a system for establishing a level of solidarity among them to prevent the system to function. It involves an aspect to the socio-control process.

In the application of this theory to the topic under study, it tends to provide the structural malfunction that causes such environmental hazard called flooding in Anambra State. By this malfunctioning of a unit which can be represented as dams, drainage system etc. When this structure are not taking care of or managed properly, its effects can be felt on the whole system (Anambra state)

As a result of runoff, excess discharged by these units (dams, drainage system etc.) the resultant effect is flooding and when this occurs, it leads to food insecurity which affects the whole population of the state.

In Anambra state, both the state and the local governments have done little or nothing in the case of flooding. These local governments (Anambra East and West, Anyamelu and Ogbaru) is such a communities surrounded by waters and are prone to flooding. It is also recorded that, food production of these local governments in Anambra state have been adversely affected by this disaster called flooding, causing the price of available remaining food to go very high. By high price, people with low income are affected. In 2012, it was recorded that food price was at high rate all over the state. Also in 2022, the price of food was so high as a result of devastating effect of the year flooding.

Structural Functional approach explain this occurrence because, it deals with structure and its functions. Anambra state is part of Nigeria system and therefore any problem in that area affect the entire population particularly those in Anambra and its surroundings. The damages that comes from this occurrence often results in consistent economic losses, environmental degradation, deforestation and diseases and death. The emergency fund which the government release in the period of this havoc is being used to do one thing or the other thereby causing a standstill to another units in which the funds are budgeted for.

LITERATURE REVIEW

Flooding

A flood is relatively high flow which over takes the natural channel provided for runoff (Chew, 1956). It may also be described as a body of waters which rise to overflow land that is not normally submerged (Ward, 1978). It is also a condition where an extremely high flow or levels of rivers water inundate flood plain or terrain outside of the water confined of major rivers channels. Flood also occurs when water level of lakes, ponds, reservoirs, and estuaries exceed some critical values and inundate the adjacent land or where the sea surgeon on coastal lands much above the average sea level (Ross, et al 1992). Chew (1956) define flood in relationship to river. Ward (1978) specific flood to inland area. Walesh (1989), attempt to enhance floods both in flood plans and on urban surface.

Meteorological flood is a situation over a region where that rainfall is mostly higher than the climatological mean value because the natural vegetation and economic activities of the place have been adjusted to the long term average rainfall of that place (Ologunorisa & Abawna, 2005). Rossi et al (1992) provided a more comprehensive definition for flood from river,

detention and retention storage as well as storm surge. While NS-EN 752-1 (1997) define the floods scenario on urban surface.

Flood is a natural event where a piece of land that is usually dry land, suddenly gets submerged under water (Ace Geography, 2014). Some floods occurs suddenly and recede quickly while other takes days or month when floods occurs in an inhabited area, they carry along houses, bridges, cars, furniture and even people. It can wipe away farm and many heavy item. Flood can wear away land surface since it is moving water with much force. Okoala-Okaka (2010), asserts that erosion by water as battering, pulverizing, scraping, scratching, grinding and transportation of detached soil particles by flood. According to him, flood is a major agent of soil erosion and with a resultant depletion of soil nutrient and poor harvest.

Flooding occurs when a river discharge exceed the capacity of its channel to carry the discharge when there is exercise precipitation occurring over a long period of time, it leads to saturation of the soil. In this case, when the water table reaches the ground surface, there is increase overland flow or runoff. Regular flood accounts for nearly one third of all global disaster. Arizona from geophysical hazards (Smith & ward, 1998). They now appear to be more prevalent and destruction than centuries ago and are projected to increase both in frequency and amount of devastation in the future (Parker, 2000).

Floods result when a stream runs out of its confines and submerges the surrounding environment (Stephen, 2011). Similarly, Kates (1985) defines floods as an overflow of an expanse of water that submerges land. European Union (1985) sees flooding as a temporal covering of land by water, not covered by water before the incidence. Although flood may be temporal as suggested by the European Union (1985), its effects may not be temporal when such occurrence claims several lives and properties. Flood not only affects the victims but also has great effects on the national economy where poverty level tends to rise due to the incidence.

Moreover, more people are now living in flood prone area. Despite effort in many countries such as Nigeria to resist development in flood plains, there is substantial evidence that exposure to floods is growing rapidly as human occupation of flood plain intensifies in many part (Jhe et al, 2012). According to United Nation-water (2011), flood includes urban flood which is seen to have caused about half of disaster worldwide and 84% disaster, deaths in the world was attributed to flooding.

Flooding is one of the major natural disaster which disrupt the property, safety and amenity of the residents of human settlement (Jhe et al, 2012). According to Walesh (1989) define flooding as temporary inundation of all part of the flood plain or temporary localized inundation occurring when surface water runoffs moves via surface flow, gutters and sewers.

Jeb and Aggarwal (2008) defined flooding as a general temporal condition of partial or complete inundation of normally dry areas from overflows of inland or tidal waters or from unusual and rapid accumulation of runoff. Flooding is the over flowing of water either as a results of torrential rainfall , a broken Dam, a high rise in the volume of water in rivers, ocean or seas as a

result of melting ice cap or prolong rainfall, thereby flooding its neighboring environment and beyond.

Flood can be very dangerous depending on the nature and level of water volume involved. According to Smith, more than any other environmental hazard, flood brings benefits as well as losses. Furthering this assertion, Wisner et al includes the provision of critical habitat for fish, water fowl, and wide life, it also includes maintenance of high level of plant and animal diversity, replenishment of agricultural soul nutrient and transporting sediments which maintain downstream Del ties and coastal areas.

Causes of Flooding

Flooding can manifest along marina coast from wind-driven storm surge and rain-swallow streams associated with tropical typos and hurricanes. Flooding can also occur on the shoreline if large inland lakes. Climate change is also a major cause of flooding and it is an issue that is related to economic, social, cultural and physical environment if any Nation. It is a vital environmental factor that shapes and re-shape various activities of human being in a society. The United Nation framework convention on climate change, UNFCCC defined climate change as a change of climate which is attributed directly or indirectly to human activity that alerts the composition of the global atmosphere and which in addition to natural climate variability observed over comparable time periods. The unpredictability of rainfall in recent times has caused untold hardship during the raining season. Climate change works in an indirect way to aggravate flooding by altering the pattern of flooding in the flood prone areas.

Another major cause of flooding is human interaction with his environment in the form of industrialization, technology, development, urbanization, deforestation, burning fossil and agricultural activities. Activities of man are undoubtedly assuming greatest importance as causes of flooding. As urbanization intensifies, natural surface are replaced, which do not allow water to percolate readily into the ground. The effects is that a large proportion of the rainfall which should normally infiltrate into the soil or be intercepted by the vegetation and this be delayed for some time before running off, is immediately available for surface runoff into streams and rivers making them flood.

Poor planning is another causes if flooding as humans try to harness available water resource which has resulted in the construction of Sam's and other water control structure. Failure of these structure have resulted in flooding. Furthermore, in Nigeria, other causes of flooding includes;Heavy rainfall synchronizing with rivers,

Main rivers backing up the water in the tributaries, Peak flood occurring at the same time in a main river and its tributaries, Inadequate and ineffective drainage of low lying and flat area to the overflow etc.

Types of Flooding

Ground water flood: According to Macdonald (ND) ground water flooding is the emergency of

ground water at the ground surface away from perennial river channel or the rising of groundwater into man-made ground under condition, where normal range if ground water level and ground water flow are exceeded. This occurs in flood plains or low-lying areas which results to damages. This may be regard as high infiltration rate into the aquifer or a reduced withdrawal VOC ground water (Krinich & Thieken, 2008).

River flooding: This type occurs in floodplains as a results of flow exceeding the capacity of the stream channel and over spilling the banks.

Coastal flooding: This occurs in low lying coastal areas, including estuaries and deltas, when the land is inundated by brackish or saline water. Brackish-water floods result when rivers water overspill embankment in coastal reaction. This overspill can be intensified when high tide levels in the sea are increased above the normal level by storm surge condition or when large freshwater floods are moving down an estuary. Saline water coastal floods nay occurs when extremely large wind generated wave are driven into semi-enclosed bays during severe storm (Smith and Ward, 1998).

Pluvial flooding: This type occurs unexpectedly in location not obviously prone to flooding and with minimal warning and is not well understood by the general public (Houston et al 2011). Falconier et al (2009), put it this way that pluvial flooding is as the result of rainfall generated overland flow and pond before the runoff enters any water course, drainage system or sewer or cannot enter it because the network is full to capacity. The pluvial flood to an extent can be worsened if the ground is saturated, frozen, paved or otherwise has low water permeability (Falconen, 2009). The volume involved and the risk related to pluvial flooding often results in consistent economic losses and consequent damage in the long term due to the high frequency of this kind of event (Freni et al 2010).

According to Resonzweig (2009), flood can be defined as an unusual accumulation of water above the ground, which is caused by high tides, heavy rainfall, or rapid run-off from paved surface. Flood is mainly an environmental hazard of meteorological phenomenon but very often, it could be induced by human's improper utilization or abuse of the physical environment. Flood is generally caused as a result of many conditions working singly and in synergy. These conditions are mainly natural and anthropogenic in nature. The natural causes of flooding are enhanced mostly by the nature of weather and landscape while anthropogenic causes of flooding are enhanced by human activities.

In another development, Stephen (2011), examined river systems and causes of flooding in Nigeria. The study established that inadequate drainages are one of the peculiar planning problems that causes flooding. The study also further discovered that whenever the stream channel in an average section is overtaxed causing overflow on the adjacent land outside the usual channel boundaries, the stream is said to have reached flood stage. The study recognizes five types of flooding as follows;

Urban floods*:* This type of flood describes a situation where urban centers are inundated as a

result of intense rainfall, high total impervious layer (resulting in less infiltration and more surface runoff), flat topography, inadequate drainage networks, obstruction of drainage channels with solid objects etc. Aba, Uyo, Port-Harcourt, Warri, Benin, Lagos etc, are examples of cities that experience this type of flood in different magnitudes. Hazards that are associated with these types of flooding are destruction of household properties, public infrastructures such as rail-lines, electricity/utility facilities, obstruction of traffic flow, and health issues such as outbreaks of typhoid fever, cholera and etc.

Flash Flood: These are associated with intense, localized thunderstorm activity occurring in small basins. The extremely rapidity of this phenomena limits the efficiency of warning procedures and emergency actions. Thus, flash floods are the most significant flood hazards regarding the number of fatalities. Flash floods are distinguished from a regular flood by a timescale less than six hours. Lagos, Port-Harcourt, Warri and Benin City are cities that experience this type of flooding.

Channel Floods: These occur when the natural or artificial banks of any reach of a stream or rivers are over topped and spread beyond over normally dry land areas. In the upper reaches of streams and rivers, the causes of this types of flood could be associated with dam failures upstream, channel silting, and long duration of rainfall. The annual floods associated with the discharge pattern of the Niger - Benue Rivers systems fall into this type of classification and states in Nigeria that suffer this type of flood problem include Sokoto, Kaduna, Adamawa, Gombe, Taraba, Benue, Oyo (Ibadan), Niger, Kogi, Anambra, Delta, Bayelsa, Akwa Ibom, Rivers State and etc. Hazards associated with this type of flooding are channel bank failure during flood recession phase and where these occur, houses and villages are swept away besides destruction of farmland and out - breaks of diseases leading to serious epidemics and drowning.

Back Swamps Flood: This is located at some distance away from the stream channels on the flood plain. When water spills over into the flood plains, the heaviest material drops out first and finest materials are carried a greater distance. The fine grained alluvium holds much water and drains slowly creating wetland areas. Back swamps are important sponges that retain water that might cause severe flooding downstream. This type of flood is the most prevalent in the entire Delta State. The flood peaks could be unusually high not only because of the high rainfall during the year and the preceding years but also because of the excessive release of water from dams.

Adeleye (2011), examined flooding and influence of urban planning in Lagos, Nigeria. The study focused on the beneficial effects of flooding when the river overflows and its flows into the river banks, sand, silt and debris are deposited into the surrounding land. It's further established that flooding adds a lot of nutrients to lakes and rivers that leads to improved fisheries and when this river water subsided and go back to its normal flows, the deposited materials help the land to be more fertile and productive.

In Anambra state, flooding is affected by both global climate change and local change to drainage system and rivers. In these local government (Anambra west, east, ogbaru and Anyamelu) which comprises of Ezi Anam, Miniate, Ifite Anam, Olumberase , Oroma Etiti, atani,

Akili Ozizor, etc. the change are due to construction, blockage of drains and increased local runoff from land, paned and compacted surfaces.

Deforestation have increase the amount of runoff on land surface while agricultural activities affect soil composite, making than very compact, highly impermeable and reduce water infiltration (ADC, 2005). Flood is still an annual event in most of Nigeria cities particularly in river line areas in Anambra state.

In Anambra state, flooding can occurs as a results of river discharge. This places mentioned above are surrounded by water , and people are settling and living in flood plains in and around the area thereby causing outbreak of disease such as cholera , infection and food damages.

Flood Risk Management in Anambra State

Flood risk means the combination of the probability of a flood event and of the potential adverse consequences for human health, the environment, cultural heritage and economic activities associated with a flood event (European Parliament Council, 2007). According to Ologunorisa and Abawna (2005), flood risk is a product of hazard and vulnerability and a real risk level involve a certain level of hazard and vulnerability for a particular location. Flood risk management plans involve three phases including: Preparedness, Prevention and Mitigation phase (European parliament council 2007).

The three stages in flood risk management are very essential for policy makers both at the national and state level to make policy on flooding in this areas. The preparedness phase would involve activities such as predicting and identification of zones or areas that have high risk such ad Anambra affected local governments and mapping phase would involves activities such as forecasting , early warning, observation, monitoring and putting in place contingency plans in case of an eventuality. The last stage is the mitigation and reaction phase that handles activities after the disaster and there phase includes drainage assessment and relief management (Yahaya et al, 2009).

Flood mitigation can be effective when area vulnerable to flooding like some towns and villages in the local governments in Anambra state are identified and measure are put in place for preparedness, effective prevention and response. Identification of flood risk areas is of utmost important for policy planners and decision makers especially for management activities (Yahaya et al, 2010).

Food Security

According to FAO (2001), food security is a situation that exist when all people at a time have physical, social and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preference for an action and healthy life. "All people at all times" implies the need for equitable and stable food distribution, but it is increasingly recognized that it also covers the need for intergenerational equity and therefore sustainability in food production. Safe and nutritious food for a healthy life implies that food insecurity can occurs if the diet is not

nutritious, including when there is consumption of an excess of calories or if the food is not safe, meaning free from harmful substances. Furthermore FAO et al (2018), assert that undernourishment occurs when an individual habitual food consumption is insufficient to provide the amount of dietary energy required to maintain a normal, action, healthy life.

In addition to malnourishment, in the sense of insufficient calories (hunger) malnourishment occurs in terms of nutritional deficiencies caused by flooding it low nutritious land system.

Food security is a phenomenon which is multidimensional with economic, environmental and social aspect. Food is no doubt the most basic of all human survival needs. Although, some effort have been sort in improving the quality as well as production of food supplies, but food insecurity remains prevalent , particularly in Anambra state where environment is mostly surrounded by water and this can lead to flooding away nutrients and destruction of fertile farm land in which we used for this food cultivation. Food insecurity can be linked with issues in population growth, surge in energy demands, flooding as a result of discharge from rivers runoff or rainfall runoff.

The term food security emerged in the mid-1970s at the world food conference (1974). During the conference food security was defined in terms of supply of food as "assuming the availability and the price stability of basic foodstuff at the international and national level. Since the world food conference of 1974, the concept of food security has evolved into what is now generally agreed the standard definition which was adopted during the world food summit in 1996. The world food summit, 1996 agreed that food security "exist when all people, at all times have physical and economic access to sufficient, safe and nutritious food that meet their dietary needs and food preference for an active and healthy life.

From this definition, from component if food security are identifiable, these are;

Availability of food; Access of food; Utilization of food; and Stability of food.

Availability of food: There has to be physical, social and economic access to sufficient and nutritious food by all people and at all times. Such food must satisfy the dietary needs and preference of the people. It is the amount of food physically available in a region, state or place. Availability of food depends on the level of local production, imports and stock level and net trade in food items.

Access of food: This refer to economic, social and physical access to food by all people at all times. By so much availability of food to national and state level does not implies it is accessible to household level, therefore, it must be locally accessible and affordable.

Utilization of food: By this, it means determination by food quality, nutritional values, preparation method and storage as well as feeding pattern. It refer to the pattern in which the body makes use and benefit from the various food nutrients.

Stability of food: These encompassing all other three component together. This refer to the

stability of food availability, accessibility and utilization over time. A person who has adequate access to quality food today is still considered food insecure, if he has periodic access to food which may cause his nutritional level to deteriorate. Variation in weather condition, political and economic instability and price fluctuation are some factors that may impact on food security status.

In Anambra state, the interplay of all these component or variables determine whether the local governments is food secured or not. This, is because if two is present without the other ones, it leads to food insecurity and this food insecurity cause malnutrition, lack of dietary, diseases etc. According to World Bank (1986), food security is access to enough food for an active, healthy life at present as well as ability to provide enough in the future.

Food security in a general context has been defined as the ability of countries, regions or households to meet their required levels of food consumption at all times (Siamwalla and Valdes, 1981). However, since the ultimate focus of food security is normally on households, food security has also been defined as a situation in which a household has both physical (supply) and economic (effective demand) access to adequate food for all its members and it is not at undue risk of losing such access (Shama, 1992). Food security is however, not synonymous with food self-sufficiency. While food self-sufficiency connotes the capacity of a country or households to supply all the food it requires from internal sources and without resources to external supply sources (as in a state of autarky) food security does not require self-sufficiency in food supply, as long as a country has adequate capacity to import additional food it requires to augment its supply from external sources, without undue risk. Food insecurity may also be transitory or chronic. Transitory food insecurity is temporary or transient, arising from temporary shortfalls in food supply relative to the requirement, or temporary loss of adequate effective purchasing power for food. Seasonal and annual fluctuations in food production, temporary loss of employment and similar factors often create transitory food insecurity.

Abudullahi (2008), defined food security as when people have physical and economic access to sufficient food to meet their dietary needs for a production healthy life at present as well as in the future. Absence of food security is food insecurity. By this food insecurity, Adept (1989), opine that chronic food insecurity arise from lack of resource to acquire and produce food, thereby leading to persistent inadequate diet. It also represents lack of access to enough food and can either be mild or disastrous.

Furthermore, there are fundamental threat to food crisis when food insecurity occurs. These threats are;
Moral and Humanitarian threat: Hunger, poverty and diseases are interlinked and are direct result of lack of sustainable food supply. People living in poverty often cannot produce or buy food to eat and so are more susceptible to diseases. Hunger reduces the national defense against most disease and is the main risk factor for illness worldwide. Sick people are less able to work or produce food. The United Nation standard committee on Nutrition concluded that nutrition is an essential foundation for poverty alleviation and also for meeting Millennium developmental goals (MDGs) related to improved education, gender equality, child mortality, maternal health

and diseases. The need for food has resulted in man deforestation, causing serious environmental, climatic and health problems. These has hampered sustainability in food security.

Strategic threat: This threat emphasis on food price. The increase in price has reduce the purchasing power of the poor people and inhabited the ability of poor communities or societies or even country to import food for their hard pressed population. Nigeria is one of the countries in the World that import variety of food into the country in spite of good green vegetation, fertile lands and man power system they possess.

Developmental threat: Development of any societies starts from its populace. This is because man is the epicenter and end product of development. There are food insecurity in the societies, when the people are wallowing in hunger and poverty. Furthermore, this is erasing the economic gains in the past decade, while putting the risk the recent historic investment in public health and nutrition. The major challenges of food insecurity in Nigeria is the under-development of agricultural sector that is characterized by over-reliance on primary agriculture, low fertility soils, minimal use of external farm input, environmental degradation such as climate change, flooding, erosion etc, significant food crop loss both pre-and post-harvest, minimal values addition and product differentiation and inadequate food storage and preservation that result in significant commodity price fluctuation.

In Nigeria, most of the food is grown under rain fed agriculture. Food production is vulnerable to adverse whether condition. The international fund for Agriculture development (2012) rate Nigeria as the number one producer of yam, cassava, and cowpea in the world, yet Nigeria remains a food insecure nation and rules heavily on importation of grain, livestock products including fish. As previously opined by Onorogivwa et al (2014) Nigeria has about 75 percent of its land suited for agriculture but only 40 percent is actually cultivated.

Majority of the rural populace particularly in the study local governments in Anambra state engage on subsistent farming on small plots of land to feed their household and relying on seasonal rainfall. Lack of access to necessary infrastructure such as roads has further worsened the rural communities in Anambra state with poverty. These bad roads has disconnected the rural farmers from bigger markets in Anambra state. Nigeria lack enthusiasm for local products and often consider them inferior to imported food product which is detrimental to the body system of Nigeria people.

Furthermore in Anambra state, particularly the study local governments which comprises of so many communities, frequent policy change and poor performance by the state monitoring and implementation agencies also has its toll on food crisis. There are series of the government regulatory problem affecting food security in Nigeria particularly in the local government under study. These are; Unsustainable extension service system; Poor planning model and structural framework; Unconditional business environment that makes investment in agriculture unattractive to foreign investors.

A number of national policies were not helpful in the government effort to transform the agricultural sector and land use Act, importation tariff and other unproductive policies etc. Inadequate financing of agricultural research and industry as well as farmer's capacity building etc.

Habitual alteration (termination of other non-agricultural due to changing government regime.The communities in these four local governments in Anambra state are mostly agrainia place which is reflected or seen in the fact that over 90 percent of her economically active population is employed in the agriculture sector. The difference lies in the types of crop each communities are best known for deepening on the size of the land available.

Preponderance of Flooding and Food Security in Anambra State

As noted earlier, flooding occurs when a normally dry area is completely or partially submerged by water. Flooding is an intractable environmental problem that has negative impacts on agriculture and food security in some state of the country including Anambra State. Some local governments in Anambra State including Anambra West Local Government has been noted to be adversely affected by flooding partly because of lack of resources, infrastructure deficit and ineffective disaster management programs (D'Odorico & Rulli 2023). The international development community has recognized agriculture as being central to economic growth, food security and poverty alleviation, especially in countries where it is the main source of livelihood for the poor (World Bank 2007; FAO 2011).

Despite being rated as having the highest oil reserves in Nigeria with large amounts of untapped natural gas and oil, Anambra West is regarded as the foods basket of Anambra State. In Anambra West Local Government, above 70% of the population depends on agrarian sources of livelihood though they lack required cum necessary social amenities as most of the residents of this area goes to the stream, spring and river to fetch water to drink (Okeke & Ofodu, 2018). On the lack of required social amenities in Anambra West, Ozoji (2023) reported Hon. Patrick Obalum Udeoba (the lawmaker representing Anambra-West State Constituency) as noting that the council headquarters and other areas are without good roads and lack electricity.

Agriculture enhances food security in two ways: food production and provision of livelihood sources.The inner correlations between floods and food security in Anambra west is extremely relevant because the residents depend primarily on agriculture, which can be highly affected by extreme events, damaging their primary access to food. In agreement, Ibezim and Okafor (2022) have asserted that flooding is one of the major culprits responsible for the high poverty level of residents in the local government.

Flooding has been noted to negatively impact agriculture and food security by causing loss of livestock, destruction of crops, reduction in quality and quantity of food eaten, increase in price of food, destruction of roads, destruction of farm storage facilities and stream pollution (Israel & Briones 2022). This is an indication that rural dwellers (those in the affected areas in Anambra West) residing in the hinterlands experience these impacts first hand more than urban dwellers,

whose primary occupation is not usually farming.

Against this backdrop, there was flooding in Anambra State in 2022 with devastating effect in Anambra West. The table below represents household food security status before and after the deadly 2022 flooding in Anambra West Local Government.

Town	Food security before flooding	Food security after flooding
Oroma-Etiti	37.5%	15.6%
Umueze Anam	25%	9.4%
Owelle	43.2%	13.6%
Inoma-Akator	25.6%	18.6%
Mmiata Anam	26.8	19.5%
Umuoba-Abegbu	30%	10%
Umuenwelum Anam	44.2%	17.3%
Ukwalla	32.8%	15.4%

Source: IOM (2022)

The table above revealed that food security in Anambra West which already is not at the expected levels in line with the tag 'Foods basket of the state' nosedived after the 2022 flooding in the state. That is to show that flooding has adverse effect on food security in the state. Furthermore, Obikeze (2023) posits that flooding in Anambra West Local Government in 2022 resulted to destruction of farmlands, rise in food prices, disruption of sources of livelihoods, pollution of streams, reduction in crop harvest, decrease in quality and quantity of food eaten.

Similarly, Obiechina (2023) noted the negative effects of the 2022 flooding on food security in Anambra West Local Government Area. According to him (p.34), the adverse effect of flooding on food security in Anambra West can be noticed easily through changes in food consumption patterns as the flooding affected food accessibility, availability and utilization. It is against this backdrop that this section upholds the first hypothesis, thus we assert that flooding has negatively affected food security in Anambra State.

Flooding and Environmental Management in Anambra State

Flood and environmental management is a concept aimed at recognizing the close connection between flooding and managing its risks to the physical environment and biological ecosystems. The concept aims to address the nexus between flood, waste, and biological ecosystems by applying both structural and nonstructural solutions, and taking into consideration urban-rural and upstream-downstream linkages, in development planning and project implementation. In other words, environmental management promotes spatial (local and river-basin scales), functional, and organizational integration. Especially important is the fact that environmental management also recognizes that other interventions to improve the economic prosperity and social well-being of communities can have an impact on flood risk, the environment, and the sustainability of ecosystems. It is therefore proposed

that, during the formulation of a development plan or project with potential impacts on flood risk and on the environment, there should be an assessment to determine those impacts within the targeted area.

In Anambra state, flooding which is a natural disaster has varied adverse effect of food security, as well as its concomitant negative effect on the environment and biological ecosystem. For example, soil erosion which is an environmental risks cum hazard of flooding usually results to increased pollution and sedimentation in streams and rivers, clogging of the waterways and decline in fishes and others species of aquatic animals/organisms. Flooding also degrades lands, which means it can support fewer plants that can take in climate-warming carbon dioxide.

It is sequel to the observation of the need to protect the environment that the state government established the Anambra State Sanitation and Environment Protection Agency (ANSEPA) which is charged with the removal, collection and disposal of domestic, commercial and industrial generated waste; cleaning and maintain of public drainage facilities; removal and disposal of abandoned scrapped vehicles; and streets sweeping of major roads.

In light of the above, flooding do affect environmental management in Anambra state like moving refuse dumps from their designated areas to various places thereby hampering the efforts of the state to manage its environment vis-à-vis waste management as well as destruction of some public drainage facilities. Anyadike (2022) noted that a look around the local government reveals massive destruction of public drainage systems occasioned by the recent flooding in the area.

It is in this regard that we conclude that flooding have adverse effects on the environmental management in Anambra state and thus requires urgent synchronous actions by all tiers of government to stymie it.

Government Response to Incidences of Flooding in Anambra State

Giving the nature and character of flooding in the state with its concomitant varied adverse effects, it is only natural for one to anticipate that the state government will in one way or the other respond to the disaster. Various interventions by the state government and other tiers as well as individuals and international bodies have been witnessed in Anambra West Local Government after the 2012 and most recently the 2022 flooding. According to Okafor (2023), the state government evacuated persons and provided needed health services in the local government as well as other areas affected by flooding in 2022. In addition, some relief material were also sent to the affected communities. Though, it is pertinent to note that the communities added that the interventions were inadequate as many of the affected families lost their means of livelihood and homes, thus, plunging them into hardship and debts.

Furthermore, the state government has called on the National Emergency Management Agency (NEMA) for urgent intervention in flood affected areas of the state (Ejike, 2023). In this regard, the director-general of NEMA, Mustapha Ahmed noted that “the discussion also touched on the

collaboration between the Anambra State government and NEMA in the deployment of resources, personnel, and equipment for effective flood response as they emphasized the need for a well-coordinated approach, early warning systems, and community engagement to enhance disaster preparedness and management in the state."

Finally, the state government have also set up Anambra State flood response committee. According to the Peoples Gazette (2023), some of the terms of reference of the committee include ensuring that flood victims are timely evacuated, protected and provided for in their various holding camps. Also, the committee is expected to examine the level of preparedness and report any challenges ahead for possible solutions as well as provide quality health care and recreational activities at such areas.

Against this backdrop, the study concludes that the state government has responded positively to the incidences of flooding in the state. Though, more needs to be done especially in partnership with other actors like local and federal governments as well as individuals, corporate bodies and international bodies.

Conclusion and Recommendations

Being self-sufficient especially in agriculture is sine-qua-non for development of the under-developed countries as food is a basic need of man. Food security is very important for the development aspirations of the state and country at large. Owing to the identified worry and problem of the study, the researcher embarked on the journey to investigate and unravel the effect of flooding on food security in Anambra State.

From the analysis and findings; it isevident that the effect of flooding on food security is immense as well as the adverse effects it has on the environment. Consequently, it is necessary for governments at all levels to come up with pro-active and synchronized measures cum policies to forestall the negative effects flooding has on food security. Specifically, the study recommends:

1. Owing to the negative effects flooding has on food security and against the backdrop that flooding is a natural phenomenon, there is an urgent need for all the actors to take steps to reduce to the barest minimum the adverse effects of flooding. Some of these steps include irrigation farming which encourages all-year-round and off-season planting, provision of necessary amenities to avail the farmers the opportunities to store well their agricultural products as well as adequate means for supply.
2. Since we have concluded that flooding also have negative effects on the environment, it becomes paramount for the local government, state government and in partnership with the federal government to initiate far reaching policy measures to minimize the effects flooding has on the environment. Coupled with the challenges of global warming and climate change, this is of utmost importance.
3. Having found out that the state government has responded positively to the incidences of flooding in the state, it is hereby recommended that they go a step further by

implementing all recommendations of different bodies or committees set up to look at the cases of flooding as well as to also be pro-active in dealing with the menace.

4. Furthermore, food safety net and poverty alleviation programmes should be set up to help the poor who are the most vulnerable to the effects of flooding.

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