

## THE RIPPLE EFFECTS OF FLOODING ON WOMEN IN NIGERIA

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**Abstract:** *This paper examines the ripple effects of flooding on the roles and economic activities of women in Isoko- Nation, flood-prone areas that exhibit low-lying plain that resides on the coaster region of Delta State. The region attracts high population due to flooding fluvial deposits on the flood plains that serve as fertilizer to boost agricultural activities of the people. Consequent upon this, the socioeconomic development of the region is facing reversing years of progress, socially and economically in response to the rippling effects thus crippling effective and sustainable role of the women. The situation is worsened by lack of infrastructural facilities to encourage alternative income earning activities. And the dearth of the women socio-economic status means the dearth of socio-economic development of the region therefore the need to sever the women from the rippling flood effects is vital to the sustainable development of the region. Therefore the paper discussed the implications of the downgrading and reversed economic activities of the women on the sustainable development in the region and noted that though the annual flooding occurrence in the region cannot be completely eliminated however the associated disasters can be mitigated and the rippling effects reduced. The paper recommends that a proper understanding of the season and dynamic climatic trends of the region will create conscious knowledge on the mitigation strategies to reduce the unprecedented effect of incessant flooding and ginger the effort of the government to fulfill its commitment of improving the quality of lives and standard of living in Isoko-nation. The study substantiate that provision of infrastructure would energize the women whose socio-economic status is on the decline to embrace alternative source of income that would revive their hope and faith in the economy of the region.*

**Keywords:** *Flooding, Ripple effect, Isoko-nation*

### Introduction

Recurrent flooding has grown to be a major concern and a global phenomenon, especially in recent decades due to the danger it poses to both human life and the survival of the environment. A flood is a body of water that resides on normally dry land. It is a yearly occurrence that naturally results from God's creation and seasons, so it is neither

unexpected nor unanticipated by human existence. However, it becomes an issue when it has destructive and catastrophic effects that endanger human existence. This occurs when there are excessive rainstorms and the soil is unable to absorb the extra moisture, or when a river, lake, or even the ocean overflows its bank onto the adjacent land. Similar to how natural snowmelt can cause an enormous and excessive spread of water to previously dry areas, leading to a flood. It can also be brought about by human activity through advancements in technology for a higher standard of living. Flooding can take many different forms; vary in intensity from one year to the next, and from one country to another. Depending on the timing and the causes, it can arrive with mild effects, minimally without causing a major catastrophe, or occasionally very massive with devastating effects. In contrast to some natural disasters, flooding can be managed when proper planning and the necessary infrastructure are provided. However, lack of environmental infrastructure in the current urban planning practices, which contributes to and exacerbates flooding issues, makes flooding primarily human-induced (Agbonkhese et al., 2014; Satterthwaite 2017; Peduzzi, Doa, Harold and Mouton (2009) noted that “the rate of flood occurrence in recent years has been unprecedented having at least 70 million people as victims of yearly flooding and more than 800 million living in flood-prone areas globally. Nigeria in this last decades witnessed intermitted flooding but the situation in 2012 and the recent 2022 in particular seem to be the most critical in terms of coverage and disastrous impact. For weeks, most Nigerians in the affected areas were locked up in waterlogged homes and the major route across the southern parts of the country were submerged which made them impassable while citizens faced with search for alternative routes which were not readily available particularly the 2022 flood incidence. Travelers were not only frustrated but all their economic activities were in standstill because the floods were instantaneously hazardous and devastating. It was a case of irreversible destruction and losses as the unpredicted heavy rainfalls collided with vulnerable environment without human resistance. Heavy rainfall combined with irresponsible environmental behavior and a lack of drainage infrastructure in the majority of Nigerian cities has left hundreds of people homeless and in distress.

While climate change has caused more rain than in the past, increasing the frequency of flooding in Nigeria, the country's flooding is primarily caused by human activity and made worse by interactions between humans and nature.(2012)Aderogba. Additionally, the Lagdo Dam in Northern Cameroon's water release is responsible for the flooding in Nigeria. The lack of a corresponding dam in Nigeria makes it more difficult for the already overflowing river banks to disperse the excess water over the nearby dry land after it is released. Every aspect of life is disrupted when flooding occurs. By virtue of natural occurrences, it is expected that human existence should be adequately prepared to mitigate flooding and its devastating effects on human life and property, but this yearly event frequently manifests as a result of individual or governmental under preparedness. Even government agencies frequently respond poorly to flood warnings, which shows a serious disregard for the welfare of the nation's citizens. For instance the United Nations (UN) has expressed concern over the flooding in Nigeria, saying it will lead to negative ripple effects “We are gravely concerned that the flooding will worsen the already alarming food security and malnutrition situation in Nigeria” (Dujaric, S. UN Spokesman) Oct. 2021). It is expected that this concern should serve as warning signal for proactive strategy yet no attention was adequately given to this statement to safeguard the 2022 flooding

incidence. Aguyi (2022) “It is worthy to note that the National Emergency Management Agency and other associated agencies have been reactive in handling issues of flooding rather than proactive. What is usually done can be described as post-disaster management....I would like to confirm that the Nigeria Meteorological Agency(NIMET) releases regular weather data and predicts the rainfall pattern which is seldom used for planning by the agencies in charge of disaster management.” Flooding has thus been a frequent occurrence over the past few decades, and when it does, it has devastating consequences such as the loss of life and property as well as environmental degradation, which has a significant negative impact on the social, economic, and political development of the country. The destruction and damaging effects of flooding on social life, the economy, and environmental health notwithstanding, floods can be very beneficial to the environment because of the rich, fertile alluvium accumulation deposits on agricultural areas when it recedes and serves to replenish channels for irrigation.

The history of flooding in the nation has seen enormous catastrophes that have affected people in many different ways and caused years of gains to be lost at each occurrence, but no proactive measures have been put in place to lessen future severe occurrences. For instance, the recent flooding episode which has been described as the worst and deadliest ever witnessed in the series of this decade aside the 2012 flooding with very high impacts and an estimated loss of 2.2 trillion to the country in terms of human, material and production is an evidence of the country’s poor response or negligence to early warnings. The 2022 flooding update has recorded 34 against 30 states affected in 2012 and having 3.2 million against 2.1 million persons affected with 603 deaths against 365, 2400 against 585 injured and others. (2022 flood update –Nov.2<sup>nd</sup> &2012 Flood Post-Disaster Needs Assessment report, June 2013). In realness, the extent and nature of flooding in Nigeria are mostly sporadic and unprecedented such that the accurate data for displacements, losses, and fatalities cannot be truly ascertained. The immediate negative flooding impacts and post-flooding catastrophes on the social economic and political status of the nation are much more evidenced or pronounced on the flood-prone areas that exhibit low-lying plain that resides on the coast region of the nation such as Isoko-Nation of Delta State where there is total reliance on farming and fishing as the major economic activity shouldered mostly by women. And because of their social and economic roles they suffer lengthen recovery period, the risks of secondary stressors arising and worry about the frequent recurrence of flooding. It is on this dimension this study examines the ripple effects of the flooding on women who double as home builder and a major proponent of social and economic growth of the society in Isoko-Nation.

### *Statement of problem*

The issue of incessant flooding of the decade has become evolving challenge that needs investigations to avert the associated risks and hazards as well as the post-flood ripple effects. Accordingly, understanding flood hazards requires a better comprehension of the types and causes of flooding, their probabilities of occurrence and their velocity (Nwoke and Okoro, 2012). This is necessary in designing measures and solutions which can prevent or reduce the damage from specific type of flood. Added, it is important to have a thorough knowledge of the population that resides at potentially flooded areas, the level of their vulnerability and assets at risk and how often flood events are likely to occur. The flood-prone region of Isoko-nation is undergoing a serious and growing developmental

challenge with the ripple effects of flooding in recent years which requires some investigations. This is specifically important as it applies to the women whose economic status and role have been the bedrock of the economic growth and development of the region is facing a major decline and threats because they are the most vulnerable to the flooding disasters and fatalities.

While the flooding in the region has been seen and accepted as annual event in the years past, the intensity of disaster and devastating rippling effects associated with evolving dynamic flooding undermines the natural annual event, nevertheless the emerging plaguing situation could be avoided if adequate and appropriate measure is put to checkmate the occurrence and manifestation. Besides, there is absolute absence of infrastructural facilities meaning lack of Government impact in the region that heightened the vulnerability of the women being myopic to alternative source of income.

### *Objectives*

The general objective of the paper is to examine the ripple effects of flooding on women in Isoko-Nation which include their economic activities and socioeconomic status. To examine the extent to which the victims cope with the rippling effect of post flood disasters.

To investigate the post flood ripple impact on the growth and economic development of the region. And to find out what could be the most effective mitigation strategies based on the study of the region.

### **Conceptual and theoretical framework**

The recent floods and their effects around the world are becoming too frequent and pose a threat to sustainable development in human settlements, especially in the wetlands of the world like Nigeria. Flood is an overflowing or eruption of a great body of water over land not usually submerged. (Daniel and Udo, 2019). And flooding has been defined as "a natural process that occurs when the level of a body of water rises until it overflows its natural banks or artificial levels and submerges areas usually dry. It is a natural occurrence with both positive and negative effects on the ecosystems it affects". (Encyclopedia of Engineering, Geology, 2016). It is an extreme weather event naturally caused by rising global temperature which results in heavy downpour thermal expansion of ocean and glacier melt, which in turn result in rise in sea level, thereby causing water to inundate coastal lands. (Magmi et al. 2014). That is to say flooding is a general temporal state of partial or completely submerged inundation from infrequent and rapid collection of runoff. It is one of the worst natural hazards with the potential of negatively affecting lives, leading to loss of properties and ultimately resulting in the extinction of species in the environment of occurrence. In other word, flooding is not only a threat that determines the sustenance of the environment but a defining factor of environmental quality of the inhabitants or indwellers.

According to (Akolokwu, Adesogba, & Bariweni , 2012) , flooding is a significant environmental challenge that requires global intervention . Because it has an impact on human health, the environment, the economy, and social life, flooding poses a threat to sustainability. Depending on the type and cause of the flooding, it can pose a serious threat anywhere it occurs, including outside of flood-prone areas of any nation. Flooding has a

variety of effects on human behavior and changes environmental history, which can reverse socioeconomic development and political progress in the affected countries. The effects of flooding vary from country to country, but the poorer countries are more vulnerable to flood disasters, and the number of people killed by floods is lower in developed countries than it is in developing countries because the latter lack effective zoning regulations, flood controls, emergency response infrastructure, and early warning systems (Stephen, 2011).

While flooding can be viewed as devastating in terms of the loss of human life and property, the paralysis of production, the breeding of deadly diseases, and the trauma of starvation on those who survived due to the negative impact on the ecosystem, it also brings nutrients and essential elements for life. Seasonal flooding can revitalize ecosystems by supplying water that is vital in many different ways. The effects of floods are not always as negative as most people think; they can actually have some positive effects because natural flooding benefits nature more than its complete absence. What makes natural flood a disaster is when food waters occur in areas populated by humans and areas with significant human development but when left in its natural state, the benefits of floods outweigh the adverse effects. ( Abowei and Sikoki ( 2005)& Bradshaw et al (2007) ).

In other words floods have some positive impacts on aquatic life as a result of nutrient deposition and when flood recede the sediment and nutrients left on the floodplains gives rich, natural fertilizer that improves soil quality that has a positive effect on plant growth, thus increasing productivity in the eco system. Further still, flooding recharge ground water when it occurs which the ecosystems greatly rely on during dry season for the supply of fresh water. This positively impact on soil health that leads to more productive cropping and pasturing lands. Floods play a pivotal part in the maintenance of the earth natural cycles though its intermittent and the magnitude of occurrences manifest ripple effects on humans and the ecosystem. That is to say that the flooding provokes negative multiplier effects with chain reaction on human existence and the environment. And women who impact natural resource management through their various roles in households, the economy and society are more vulnerable to environmental degradation and climate change due to natural frailty and low socio-economic status therefore suffer in several ways and levels of ripple flooding. According to American Dictionary (Google) a ripple is a small wave or slight movement of a surface especially the surface water as flood. It can be seen as sound or feeling that is slight but noticed. Ripple effect means series of things that happens as a .result of a particular action or event. Also the phrase or term ripple effect has been defined by Oxford Language (Google) as “the continuing and spreading results of an event or action- the ripple is huge when something happens” The ripple effects are the series and chain reactions or consequences of flood disasters that may bear irreversible hardship on human life, social, economic, political and environmental sustainability unto sustainable growth and development of the nation. For instance the after-effect of flooding can be evident on the degradation of environmental soil by the spread of chemical pollutants in the flood plains. This in turn affects the fertility leading to lowers productivity and scarcity of food that engenders hunger and starvation that breeds malnutrition birthing ill-health and eventual dead as well as strangulate social and economic status of the inhabitants and so incapacitates sustainable growth and development at large. Essentially the most important flooding and post-flooding impacts are socio-economic, health-related, ecological and cultural issues which further manifest

ripple effects that threatens human existence and growth particularly the women folks who more vulnerable and susceptible to flood disasters.

This study employs The Vulnerable theory and Pressure and Release framework which show that a disaster happens only if a hazard meets a vulnerable situation. Vulnerability is conceptualized here in rural live perspective that focuses on agriculture, as a principle source of income which recognizes a variety of means through which an individual (or more often a household) can earn a living. It is connected conceptually to external stresses and shocks and internal coping capacity. Chamber & G, R. Conway (1992). The theory focuses on why people and communities are susceptible to loss from disaster. Accordingly, the root cause of a disaster or social disaster occur when unsafe condition intersect with environmental hazards, 'The release' part of the model suggests that these conditions can be reversed and vulnerability reduced if we know what they are and mitigate them. Zakour and Gillespse,(2013). The theory originated in 1970 when researchers reported that even though the number of disaster remain about the same, the losses were rising significantly and further, disaster of the same magnitude often produce vastly different consequences. It was hypothesized that disasters were not only influenced by the physical environment but also deeply rooted in social systems thus vulnerability became a central focus in reducing losses from disaster. Hewitt,(1983, Cunny.1994, Wiykman &Timberlake, 1984)

Accordingly the cause of vulnerability can be traced back from the unsafe condition, through economic and social change pressures to underlying root cause. Pressure model is an organized framework outlining a hierarchy of causal factors that together constitute the pre-conditions for a disaster. It can be described as a pathway, progression of vulnerability or a chain of causation. It is a sequence of factors and processes that leads one from a disaster event and its proximate causes back over more distant factors and processes that initially may seem to have little to do with causing the disaster (Wisner et al. 2004). In other words, it is a ripple effect a situation in which one event of disaster produces effects which spread and produce further negative effects even small changes. The threats of incessant flood hazards particularly in the wetland regions of the country have become complex and interrelated while vulnerability is fast growing. The flood disaster led to the devastation of the environment that occasioned food shortage and lack of shelter manifesting in hunger that further increased the vulnerability of victims, immensely depreciating their nutritional status and currently impacting heavily on their health.

Pressures are caused and increased by a set of inherent factors which give those in position of power to exhibit certain behavioral attributes. These underlying causes may be political ideas, economic principles or due to cultural issues or practices. People's vulnerability at local and international levels can often be linked back to poor governance, inequality, greed, injustice and prejudice (Wisner et al. 2004). These issues though may seem far from the rural community they can have a powerful and far reaching influence in terms of government provision of infrastructure for development. Invariably, the poor response attitude and lack of preparedness despite the meteorological warning on inherent flooding often make the flood prone victims vulnerable to the yearly flood disaster and irreparable devastation in Nigeria. In Isoko-Nation the people are linked with poverty because of lack of government presence and so vulnerable to flood and its rippled disasters. The flooding in Nigeria is caused by dam failure, overflowing of major rivers, coastal

storms, ignorance of warning from Nigeria meteorological agency, delay in evacuation of flood victims and settlement of people at flood prone areas such as riverine and sea coast. (Google pdf.) According to Etuonovbe (2011) Lack of provision for drainage is one of the main causes of urban flooding in Nigeria. There is a pressing need to construct drainage system to tackle the flooding problem. Poor attitude to sanitation and waste management system often leads to blockage of drainage blockage that results in flooding during raining seasons. Unregulated Urbanization and Population growth lead to deforestation for building expansion and conversion of agricultural land for residential areas to accommodate the growing population and industrial needs without spatial planning. Nigeria's flooding is inextricably linked to poor urban development practices. (Omoboye Festus 2014).

In the flood prone region, the people see flooding as integral part of their lives due to proximity to their sources of economic livelihood therefore they are faced with three stages of life styles annually, the period before, during and after flooding. And to sustain this inherent life style the area requires government infrastructural development. Isoko-Nation is one of the most dominant affected area in the Delta region of Nigeria where flooding is an annual event that its rippling effects are mostly irreversible and the women who are more vulnerable physically, socially, economically, politically and culturally are the worst victims. The study focused on how Isoko women respond to protect and cope with the continuous exposure to disruption of physical structures, risk- income, personal belongings, and loss of lives, injuries and trauma of flooding living in this area.

### **Causes of flooding**

Flooding is a recurring natural occurrence brought on by atmospheric conditions or human activity as a result of infrastructure development. Depending on the nature and cause affecting multiple communities, floods can happen anytime, anywhere, and without prior notice. Numerous factors, both natural and human-caused, have been connected to flooding. In Nigeria flooding has remained a prevalent environmental problem, (Sulebet al, 2016, Bamidele and Badiora , 2019). The studies pointed to the fact that flooding has negatives implications on the survival of livelihoods, social and economic activities. Accordingly, flooding in Nigeria is caused by weak implementation of planning policies, streams and channel obstructions due to indiscriminate waste disposal habits and human activities. Odume (2022) identifies three different types of flooding that are connected because their peaks can all occur at the same time in Nigeria during a given season. These floods include fluvial flooding, which happens when rivers overflow their banks, coaster flooding, which happens when water from a marine environment submerges low-lying adjacent lands, and pluvial flooding, which happens when there are intense heavy rainstorms. Additionally, flooding in Nigeria can be viewed from the perspectives of river flooding, which happens in the flood plains of larger rivers, and flash flooding, which is sudden and fleeting and associated with inland rivers where torrential and destructive rains frequently occur, causing great trauma to the locals who have little warning. And urban flooding, a major problem in cities where existing drainage systems are clogged with garbage (Folorunsho & Awosika, 2002)

Flooding can be exacerbated by increased amount of impervious surface or by natural hazards such as wildfire which inhibit vegetation from absorbing excess rain water. Floods often happen without warning, when the capacity of the rivers is not enough to carry the water that has entered the river network from heavy rains or damaged constructed dam leading to bank overflows. The area that gets inundated quite regularly is therefore called flood plain that delivers surprise package to unprepared community (EMA, 2014; Etuonovbe 2011). Bariweni, et al (2012) also attribute incessant flooding to climate change as a chain reaction to warmer climate leading to heavy rains provoking the rise of sea level exacerbating flooding in the food prone zones. Human induce flooding emanates from poor or non-existence of drainage systems that characterized most residential areas particularly the rural setting where they rely mostly on natural drainage channels. According to Etuonovbe (2011) Lack of provision for drainage is one of the main causes of urban flooding in Nigeria. There is a pressing need to construct drainage system to tackle the flooding problem. Poor attitude to sanitation and waste management system often leads to blockage of drainage blockage that results in flooding during raining seasons. Unregulated Urbanization and Population growth lead to deforestation for building expansion and conversion of agricultural land for residential areas to accommodate the growing population and industrial needs without spatial planning. Nigeria's flooding is inextricably linked to poor urban development practices. (Omoboye Festus 2014). While flooding is nexus of dam failure, overflowing of major rivers, coastal storms, human activities and ignorance of warning from meteorological agency the decade's incessant flooding across the nation conglomerates all, however the intensity of disasters and the rippling effects varies from region to region depending on the location.

### **Women and flood disasters**

It is impossible to ignore the role of women in the family and their socioeconomic and political contributions to sustainable growth and development. Women are mothers and homemakers whose main concern is to make sure the family has access to the necessities of life, such as a steady supply of food, clothing, and shelter, as well as to maintain a healthy family. Women therefore strive to achieve socioeconomic status that includes aspects of quality of life as well as opportunities and privileges that society can support. In order to meet the demands of society, women need to be able to predict a wide range of outcomes over the course of their lives, including those affecting their physical, social, economic, and psychological health. Despite their important role, women still make up a disproportionate number of the world's most vulnerable populations because of the persistently male-dominated access to resources and positions of power. By elevating women's status, the United Nations Conference on Environment and Development (UNCED) in 1992 made a significant provision for the recognition of women's contribution to equitable and sustainable development. In other words there is a new focus on women's empowerment, fostering gender parity not only as human rights but a catalyst in the arena of politics for socio- economic and political development strategies that is currently birthing equitable and sustainable national development across the globe. It is aimed at poverty reduction, and improved living standards, good governance and productive investments premise on equal political opportunity provided by the genders as well as unrestrained access to decision-making and policy implementation processes.



Consequently, former Secretary General of the United Nations Kofi Annan argued that achieving gender equality is a “prerequisite” to achieving the other Millennium Development Goals (MDGs) including eliminating poverty, reducing infant mortality,, achieving universal education and eliminating gender gap education. The assertion is justified not only because of the need to promote equality but a key factor necessary to accelerate the growth and the sustainability of nations’ development.

In other words sustainable socio-economic status of women exhibits a progressive growth which is continuous with positive changes in terms of meeting the present needs of the family as well as progressively meeting the future needs of the family and by extension the society of habitation. Therefore socio-economic status is a key factor in determining the quality of life for women which strongly influence the lives of the children and families and the society at large.

The environment is the based factor for women social and economic existence and poverty is the greatest problem to women in achieving traditional, social, economic and political status in the society. Women are the family income managers as wives, mothers, health officers, recreations and helpmates to men, therefore eliminating poverty and improved standard of living become overall success for women. The foremost assignment of women is the eradication of hunger predicated on poverty which is the most important threat to sustainable family and national growth but critically lies under the negative threat of ripple annual flooding. As the most devastating natural disasters in the world, flooding disrupts every facet of human life leading to challenges in the environment and in most cases brings regression in development and the wellbeing as well as reduction in standard of living. Floods worsen the existing poverty and poverty in turn makes impact of the flood more severe on women by increasing their vulnerability and ultimately impairs the progress and development of women which is sacrosanct to the actualization of the dream of meeting the domestic food needs and to actualize the zero hunger policy. While the women strive hard to balance the standard of living and the environmental protection, incessant flooding in the area opposes this drive by its devastating impacts on the environment and the related activities making the desire unattainable. Women are the most vulnerable due to their low adaptive capacity in terms of physical strength, low socio-economic and political status. Women by nature are too fragile and lack resilience to manage the unexpected but devastating appearance of floods so are less able to cope with flooding swage than the male counterparts. Flooding in most instances are unannounced and women and their children become the first victims of shock and trauma that paralyses the social, economic and their health culminating to instant dead in some cases. That is to say the impacts and losses are more pronounced on women and even in flood hazardous predicament women status is worsen in the provision of protection and rehabilitation. The study focused on the ripple effects of flooding on women and the impacts on sustainability of the family and the Isoko-nation.

## **Methodology**

### *Study area*

The region often refers to as Isoko- Nation is made up of the defunct Isoko local government area borne under old Midwest State of Nigeria now Isoko North and Isoko South local Government areas with a total population size of 196,700 and 322,300

respectively. (National Population Commissions, 2022 projection.) The region came to fore as 'Isoko Nation' with Isoko nationalists struggle in 1963, for a separate division from the tutelage and overwhelming-dominant subjugation of the Urhobos under the common name of the 'Sobo' in the Old Western region of Nigeria with the creation of Midwest State. The region situated in the southern part of Delta state, lies at the coastal low-lying flood prone area of the Niger Delta Basin sandwiched between streams and distributaries of the river Niger. It is a tropical climate region that exhibits two distinct seasons annually (the dry and the rainy seasons) that manifest very high torrential rain falls and high humidity most times. The annual rains which are between July and October are often laden with recurrent flooding inflicting unprecedented devastating impacts on the region as a result of outburst overflows from the river Niger. Besides this natural occurrence, the incessant flooding is mostly aggravated by human activities and the occasional push of the released water flow from the Cameroon Lagdo Dam via the river Benue to Niger Deltaic region of Isoko- Nation, as gravely witnessed in 2012 and in the Nigeria recent worst flooding of 2022. Flooding in the region has two-side effects. While the human-induced flooding comes with devastating impacts on lives and properties and its lingering negative ripple effects, the natural annual event flooding recedes with fluvial deposits on the flood plains that serve as fertilizer to boost agricultural activities of the people.

#### *Activities of Isoko woman*

The region attracts high population due to its fertile soil that pave way for farming opportunity as well as room for fishing activities enabled by the numerous streams, canals and the rivers. This further explains the traditional occupation of the Isoko people particularly the women who are less privilege in migrating to the urban industrial cities for white-collar jobs or greener pasture except few involved in teaching and petty trading while few of the men are into the production of palm oil and kernels. The Isoko economy is therefore based on farming, fishing, and the production of palm oil and palm kernel. The major food crops include cassava which is processed locally into garri and eatable starch, yams and off season farming supplement such as corn, groundnut, pepper etc. Prior to the advent of petroleum-production in the area the male were known as the main cultivators of yams while the women were left to the planting of cassava and other crops, however the discovery of petroleum product in the area led to the abandonment of farming and to some extent fishing as the main economic venture to whim and caprices of women. This was heightened with the male continuous migration to urban cities in search for greener pasture as there are no industries in the area to cater for the growing population while the women are mostly left behind to take care of the farm and the environment. Notably the Isoko culture bequeath land and landed properties to men by traditional heritage and the men outside the family members rent or let the farming plots to women for seasonal farming therefore the economic ventures on the land belong to women while the plots of land remain the men's. The Isoko women are not only very industrious; they tend to be laying foundation for future generation farmers in line with sustainable development of the United Nations Millennium Development Goals. This was evidence under the Okowa led administration's message of self reliant through agriculture in 2018. "We panted cassava and we are now trying to spread them into the area in order for our women to benefit from them. The cassava stems are high profile species that contain vitamin A that will help those who are suffering from diabetes and eye problems and so reduce the sickness in the area.

In the future, the youths from the area will involve in the process to encourage them to be self reliant through agriculture, but for now the process is basically for women” (Ilolo, 2018). Isoko women were empowered in the area with high profile cassava stems species from International Institute for Tropical Agriculture (IITA) Ibadan who found them to be very industrious under the Okowa-led administration’s message of self reliant through agriculture in 2018 (Vanguardngr, 2018). Essentially, the socioeconomic activities in Isoko region is women dominated and the dearth of socio-economic status of the women means increase in poverty level and eventual decline in the standard of living in the region and its development at large.

Comparatively, the Isoko region of the Deltaic low-lying plains stands the worst flood prone than other areas of the State. When the floods come the water not only destroys the farmlands and crops but their homes are submerged leading to their displacement without alternative homes. The incessant flooding of the decade (2012-2022) has not only left the environment degraded but has led to retrogression of the developmental stride of the region. Two of the flooding incidence of the decade ‘2012 and 2022’ has been described as abnormal due to the magnitude of their devastating effects in the history of the area. Ossai in Sahara Reporter (2012) noted that “The most unfortunate of it all is that this is not a natural disaster per se but a man-made tragedy. There were warnings yet the relevant authorities kept mute. This tragedy is as a result of government negligence.” The region was submerged by water for weeks and majority of the people were displaced and rendered homeless.

#### *Study Data*

The study covers the two most devastating years (2012 and 2022) of the decade’s flooding incidence in the region due to the long stay, volume of disasters suffered and the irreversible rippling effects based on the available data. The region was submerged by water for weeks and victims were rendered homeless and properties destroyed there were neither instant records nor accurate information to ascertain the depth of devastation or losses. This notwithstanding, perennial by the number of persons recorded as victims it is obvious from the number displaced that irreparable havocs have been sustained due to the disaster in the region. Notably, lives were lost and all the mud houses in the region were completely lost to the floods besides properties while internally displaced camps were set up to temporarily accommodate the homeless victims while some relocated to other cities for refuge with relations or friends. The two local government councils and some private community camps in 2012 and 2022 quartered over 11,739 and 16,801 flood victims respectively in the region though there are no accurate records on the incidence. Of the total number of the victims women were more in number including pregnant women and nursing mothers as the most vulnerable group. The women were 5100 (43%) against 2078(18%) men in 2012 and 6672 (40%) against 1327(9%) in 2022 with a total number of 4561(39%) and 88802(52%) of children respectively under their care. And among them are the older women who suffer innate vulnerability, such as physical or sensory impairment which often lead to mental health and eventual death. Even the casualties recorded more women than men in each year as shown in the table below.

The 2022 flood incidence shows an increase of 16,801 (59%) in the number of victims against 11,739 (41%) in 2012 the two most disastrous years of the decade which invariably represent the level of impact and disasters. Although year 2022 has been

described as the worst of the decade, it largely demonstrated the lack of preparedness to resist the evil flood and poor response attitude of the government to mitigate the flood disaster in the region even with the new technological mitigation strategies. Despite the early warning, there were no proactive measures for potential future occurrences and awareness programmes on the new trends of flooding put in place to save lives and property after the 2012 incidence, consequently the environment and the inhabitants became more vulnerable in 2022 flood disasters. This also explains poor response attitude and gross negligent to the development of the region.

**Available Statistical Data of Flooding – ( 2012 and 2022).**

Year	Male	Female	Children	Total	Nursing mother	Pregnant women	Casualties	
							Male	Female
2012	2,078	5,100	4,561	11,739	319	79	2	13
2022	1327	6672	8802	16,801	416	106	3	18

Source: Field assessment (statistics from the two Local Government Councils and Community Leaders) December, 2022.

**The ripple effects of flooding on Isoko women**

The impacts of these floods are more pronounced on the women who are more vulnerable and mostly in disadvantage position physically, socially, economically; culturally and politically yet they uphold the economic status of the region. They constitute the house wives, widows, single mothers, pregnant mothers and nursing mothers and their children. In Isoko- nation women majorly play the role of the men as head of their homes because of their higher economic status. Majority of the husbands migrate to the urban cities for greener pasture as a result of incessant flooding and lack of infrastructural facilities which left them with no alternative sources of livelihood thereby increasing the domestic workload on women. Essentially women are the major victims in terms of population and their roles for family survival in flooding and post flooding predicaments. In the onset of hazards of flood the women are at greater risk of injury and death due to societal restriction and gender roles. Culturally in Isoko, swimming is not a skill for women nor can they respond to immediate warning to step out of the house without the male companion or directive. This impairs their decision and ability for immediate response to forestall certain casualty. Despite their incapability to swim women take the responsibility of carrying children and the elderly to safety as their domestic role as family administrators and care givers. They are therefore easily truncated and traumatized with the sudden appearance of flood leading to mental imbalance and physical instability because of fear and family security. More women die for struggling to save properties and children. Most of those who survived the flood are often reported stressful to heart attack as a result of panic and fear of future survival of the family. Even as a wife the intermittent or the sporadic nature of flooding in the region creates an atmosphere of uncertainty and traumatic environment that work against ability of woman to inspire the man for provision for the family.

Socially the Isoko women are ill-equipped with knowledge to overcome the immediate challenge and risk of flooding because of lack of access to warning signals and lack of environmental regulations. Whereas they prepare for the annual event which they see as a blessing to improve the soil and make remedial preparation the sudden and intermittent occurrence of flooding destroy transportation and communication network which often lead to social disruption that destabilizes the selling and buying of their piled up products provoking drastic economic losses. Incessant flooding in the region has been linked with the water pollution that is responsible for the increase in the number people contracting water-borne diseases and other widespread outbreak of health hazards. The affected areas depended on the streams/ wells for drinking water which are now exposed to contamination or pollutant of flooding and after flooding water, therefore the hope to live a healthy life is often derailed. This has greatly affected the women with less resistance and more vulnerable who suffer physical and emotional trauma triggered by the struggle to get the family healthy water. During the flooding periods the few hospitals are equally submerged by water therefore the women are left as the medical officers in the family and even in the camps where they are relocated. The children are acutely malnourished which poses a major concern for women. The pregnant women and the nursing mothers not only suffer stress but acutely malnourished leading to serious health hazards unto miscarriages and premature labour and birth in certain cases.

The impact of repeated flooding on the environment has led to the desertification; deforestation and land degradation of the hitherto fertile land making farming activities less lucrative and attractive for the men thus making it the business of women who are culturally less privilege to migrate to the urban cities particularly after the 2012 incidence. Consequent upon this, the economic status of the women determines the socioeconomic development of the region. Continuous farming is important not only as the major source of income but it facilitates the sustenance of their economic status and the development of the region. Instant flooding inflicts direct lost of source of income due to loss of economically productive time. In this economic endeavour, Isoko women are not given to own plots by tradition, they either farm on the husbands' plots or leased plots to grow their economic status therefore the massive loss and destruction on farm crops by flooding, impact heavily on women sources of income or employment. Besides the appearance of flood brings large water sedimentation and pollution that immediately disrupt farming activities, destroying the crops while the women remain idle for the period of flooding because of lack of alternative source of livelihood or economic activities. The women therefore suffer dislocation and the dysfunction of normal life with psychosocial effects as a result of loss of livelihood.

The long run effect is the permanent loss of income currently pervading the land consequent on their lack of saving habit in the banks or investment on other income generating activities. This is exacerbated from the lack of income or cash requirement to start fresh farming in terms of purchasing seedlings or cassava stems. For instance the 2022 flooding witnessed a total destruction and complete wipe out of all the special species of cassava stems in Isoko land where they now import from Edo state and Delta North at a very high price for planting as the flood receded. The 2022 flood incidence has worsened the women fluctuating socio-economic status arising from the incessant flood disasters of the decade so multiplying their social and economic vulnerability with no hope for the future which negatively affect the socio- economic development of the region. As the major

arable farmers the Isoko women contribute largely to food and agricultural production in the region and supply to other parts of the country as their source of income generation. Food security is the key to eradicating hunger and according to UN Declaration of 1996 World Food Summit, "it is when all people at all times have physical and economic access to sufficient safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life". The declaration commits countries to eradicate hunger and prevent all forms of malnutrition worldwide, particularly under nutrition in children, anemia in women and children among other micronutrients deficiencies –as well as reverse the trend in obesity. The conference identified four pillars of food security as availability, access, utilization and stability of food.

Again the Second International Conference of Nations (ICN2) of 2014 in Rome, Italy which emphasised 'Better Nutrition Better Lives' and that 'Hunger and Malnutrition are unacceptable in a world that has both knowledge and resources to end this human catastrophe' and commits all nations to eradicate hunger at the earliest possible date. The framework proposes the creation of an enabling environment for effective action and for strengthening sustainable food system, including through investments in pro-agriculture and small holder agriculture to improve diet and raise level of nutrition. The multiplier or value chain effect rest on social protection, strengthening health system for addressing specific conditions, improve water, sanitation and hygiene unto food safety. and agricultural products to which the Isoko-Nation has excelled for several past decades until the turn of events in this last decade of devastating flooding beyond the annual natural event. The region is today experiencing food shortage. Frequent flooding in the region (2012-2022) is responsible for the environmental change with the multidimensional devastating impacts. And the ripple effects are currently incapacitating the women in actualizing this role.

The yearly flooding has direct detriment to family food security culminating in hunger in the land that the women now find it difficult to meet the family needs. For instance it is widely reported that some women and their children often resist living the yearly Internally Displaced Persons (IDP) Camps provided by the Government to their homes even when the flood recedes because of the fear that there will be no harvest from the flooded farmlands for a long time for their sustenance and survival. As the key to sustainable quality life of the family, the Isoko women are under the psychological stress in fulfilling the role of eliminating poverty and the hunger doom currently pervading the region consequent on repeated flooding. Every flooding incident increases the degradation of the environment making the land unproductive thus deepens their vulnerability to starvation and hunger with no hope for the future. Today hunger births poverty in Isoko-Nation, a land once known for its food production and economic activities while the population is on the increase. Managing this growing population with diminishing resources and depleting income generating activities has a great tow on the lives of the women.

Poverty in Isoko land is an endemic problem due to lack of infrastructural facilities such as good roads and electricity to promote other economic activities worsened by unceasing flooding of the region. The yearly devastating flooding hampers the women social capital formation due to intensity of degradation of the environment which is their economic base. The imminent flooding also leads to morbid fear that erases their confidence and enthusiasms in the business which defines the current declining economic

status and standard of living. Most families and individuals still live in mud houses that suffer immediate destruction at onset of flooding which render the women homeless at the recession of floods. Consequent upon this the Isoko women live with insecure, low status jobs having high level of negative life events particularly after flooding incidence, for example insecure housing tenure, more chronic stressors and reduced social support which explains the women high poverty rate. The lack of safe, affordable housing often puts the women and children at greater risk of violent and society victimization and depression. Poverty therefore has creeping negative effects that greatly incapacitate the women in actualizing their economic responsibility in the home and the nation at large. Therefore the most severe impact of the ripple flooding on the women is the scarce resources expended on recovery instead of growth and development of the region.

### **Conclusion and recommendations**

Flooding is essentially an annual occurrence that has an impact on flood-prone areas of the nation. However, the recurrent flooding incidence of the past ten years has become a global concern due to its catastrophic effects on people and the environment. Isoko-Nation is one of the most flood-prone areas in Delta State due to its location on the Deltaic flood plains, where the decade's constant flooding has had increasingly negative effects on both the environment and people and that the magnitudes of floodings' effects vary. The study investigated the ripple effects of flood disasters in the area with special focus on women as a result of their vulnerability to flooding disasters in respect to their socioeconomic role and sustainable development in the region. The persistent flooding has worsened the degradation making the land less fertile for massive agricultural venture and unattractive business to the male folks who now migrate to urban areas in search of greener pastures, exposing women to the risks of farming and stifling the region's economic development. Consequently the repeated flooding have now resulted in a steady decline in the socioeconomic standing of the women who, up until now, have been the main drivers of the area's socioeconomic growth. The vulnerability of the women and the environment to the incessant flood disasters reign multiplier socioeconomic effects which is now a defining factor of the economic growth and sustainable development of the region. The study revealed that Isoko-Nation, a region once known for production and supply of food items to other parts of the country now experience food shortages as a result of repeated flooding and the associated rippling disaster effects. *Currently, the socioeconomic development of the region is facing reversing years of progress, socially and economically in response to the rippling effects thus crippling effective and sustainable role of the women. The situation is worsened by lack of infrastructural facilities to encourage alternative income earning activities. The implications of the downgrading and reversing economic activities of the women is the dearth of their socioeconomic role and the dearth of the women socio-economic status means the dearth of socio-economic development of the region therefore the need to sever the women from the rippling flood effects is vital to the sustainable development of the region.*

According to the aforementioned, though flooding is a natural occurrence that cannot be completely eliminated, some actions can be taken to lessen the potential ripple effects on women. These include the types of measures that could guarantee the safety of people and property, especially the vulnerable women in the Isoko-region.

1. Similar to their male counterparts, women should be given awareness and orientation of the new trends of flooding, which go beyond the annual natural occurrence, and be exposed to early warning systems to save lives and property, as well as proactive measures for potential future occurrences. On this flood forecasting and flood warning backed up by improved communication system and community awareness programmes be introduced.
2. Detention basins should be put in place in the flood plain as a temporary measure to catch floodwater and provide room for people to flee or be evacuated as well as the provision of good standard and healthy flood emergency shelters.
3. To lessen the effects of any disaster, the populace should be encouraged to preserve or reforest the flood-prone area. Flood hazard mapping with land use and building controls should be enforced in the flood-prone areas.
4. The regional infrastructure needs to be developed better by the government in order to promote alternative income sources and raise the living standards.
5. The government should support the region's agricultural drive by providing cassava stems and other farm seedlings/tools to address the losses and thereby revitalize the economic activities as well as restore hope and status of women in the pursue of sustainable development.

The study aligned with the fact that flooding in the region cannot be totally eliminated and the inhabitants cannot be relocated due to their natural attachment and means of livelihood. The need for proper sensitization and routine orientation on the new climate trends and its implication on the environment is crucial to reduce the flood disaster. That the issue of flooding and the disaster effects require the collaboration between the three levels of government, the communities and other Nongovernmental bodies to manage the victims and help to curtail the rippling effects. There is need to embark on yearly proactive and invigorative measures to tackle the issues of flooding by the introducing modern mitigation strategies as practice in the developed world setting rather than the reactive strategies often employed. The provision of infrastructural facilities that would enhance alternative sources of income in the area will encourage diversion from the mono economy in the region unto enhancing standard of living.

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