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RESEARCH ARTICLE

EXPOSURE, BELIEVABILITY AND COMPLIANCE OF ANAMBRA NORTH FARMERS TO EARLY WARNING MESSAGES ON FLOOD

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Abstract

Using the flood years of 2019, 2020 and 2022 as benchmark, this study examines the exposure, believability and compliance of farmers in Anambra North to early warning messages on flood mitigations. As the government, relevant bodies and agencies have raised concerns by introducing the use of early warning messages as mitigations measures, negative effects of flood are still felt especially among farmers who face multifaceted losses yearly, necessitating the need for this academic inquiry. Anchored on the Protection Motivation Theory, this study employed the survey method as the research design while the questionnaire served as the instrument for data collection. A Sample size of 500 respondents was selected through the multi-stage sampling approach from a total population of the farmers of cooperative societies in Anambra North Senatorial Zone. The study revealed that 98% of the farmers were affected by flood during the years under review. Majority of them (73.2%) were exposed to early warning messages prior to the flood events but most of the farmers do not believe most of the measures advocated by the early warning messages. Findings further revealed that compliance to the flood early warning massages were generally low among the farmers as most of them did not relocate or observe other safety measures. The study concludes that there is still a gap between the level of exposure, believability and compliance to the flood early warning messages. It was recommended among others that efforts should be made to educate the populace on the damages of flood and that flood resistant IDP centres should be sited in the flood vulnerable communities.

Introduction:-

Given the escalating extreme weather and climatic events occasioned by global warming and ingredients, flooding has become aserious challenge, across the globe (Lino, Mwangi, Arango,& Abdillahi, 2021). Floods normally occur as a result of excessive weather events such as heavy rainfall and other conditions such as severe winds over water, unusual high tides, earthquakes, failure of dams and several others (Umar & Gray, 2022).This challenge is fueled by the Anthropogenic and geographical factors which significantly contribute to the excessive flood incidents in some places in Nigeria, especially the riverine areas.While widespread structural damages, displacement, death etc, are

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observable direct negative impacts of the flood on these riverine communities, hunger and rural-urban migration also affect these people including the farmers.The implication is that some of these riverine areas in Nigeria, especially the communities in Anambra North Senatorial Zone of Anambra State, are in low-lying areas and apparently more vulnerable to flooding. According to Umezulike, (2014), two-third of the local government areas in Anambra North form the reverine areas of the entire state and 99% of the indigenous inhabitants of these reverine areas are mostly farmers and fishermen who depend on the natural resources and agricultural produce from the water. This dependency could be why most of these farmers, reside in various farmsteads located on small inlands and along the flood plains of River Niger, Omambala,Ezichi and Ezuu, hence, vulnerable to annual coastal flood. For instance, it is on records that the devastating floods of the year 2012, 2017, 2018, 2019, 2020, 2021 and 2022 submerged most of the farmsteads in the Zone with thousands of hectares of farm and tones of farm produce washed away (Nwaiwu, 2018; Ajayi, 2020). These incidents can be attributed to the nearness of Nigeria nation to the tributary of River Niger, as, Oyinloye, Olamiju and Adekemi, (2013) recount that one-third of the Nigerian land mass is at elevation lower than eight metres above sea level.

The effect of the flooding is that the survival of the farmers and the communities will be in jeopardy. Farmers in this area bear most of the floods' negative effects (Echendu, 2020).The increasing incidence of flooding in these communities has threatened the life and survival of many. The effects of these have been felt in the various sectors of the Nigerian economy especially the Agricultural sector, calling up the need for a study on the exposure, believability and compliance to flood early warning messages among farmers in Anambra North Senatoal Zone of Anambra State.

There are various flood warning messages disseminated through mass media such as radio jingles, TV announcement, internet, fliers and bill boards in Nigeria. The Nigerian media have been rated high in dissemination of flood early warning messages (Nwafor, 2021). Also, Town hall meetings with the members of a perceived flood prone community, as well as other outdoor media channels convey the flood early warning messages. All these are aimed at achieving a positive behaviour change among the people especially the farmers whose products are heavily destroyed by the flood. The existing literature further suggests that exposure to these earlywarring messages may reduce damages associated with incidents of flood disaster among farmers in Nigeria. AsCumiskey, Hakvoort and Altamirano (2015) had recognized that exposure to such messages could engender positive responses among farmers. Surprisingly, it seems that as the warning messages on flood are available in various media of communication, there have been damages of lives and property of the vulnerable people occasioned by flood disaster, especially the farmers. We therefore interrogate the "Why"

Besides, a lot of studies (Atu& Okon, 2018; Koyode, Yakubu, Ologunorisa & Olusanya, 2017; Efiobi &Anierobi, 2013; Oladokun & Proverbs, 2016)have been carried out on the impact of flood and floods' management and risk reduction strategies but it appears little has been carried out in the area of audience exposure, believability and compliance to flood early warning messages as a possible correlation to the persistent problem of flood risk disaster in a developing country such as Nigeria. Since the effects of floods are predicted to be on the increase (Ritter, Berenguar, Dotturi, Kalas, & Samper-Torres,2021) and early warning messages adjudged effective in mitigating its effects (Lino et.al, 2021), there is need to determine the exposure, believability and compliance of Famers to early warning messages on flood. Based on this, the study investigated:

1 Anambra North farmers' exposure to early warning messages on flood.
2 Anambra North farmers' Believability of early warning messages on flood.
3 Anambra North farmers'level of compliance to early warning messages on flood

Literature:-

Flood Disaster and Farmers in Anambra State

Anambra state has witnesses a repeated incidence of flood disaster. The periods of these disasters (2012-2022) had heavily affected the people especially the farmers in many parts of the State. These negative effects are consistently witness in the State, every year (NEMA Report, 2018), a phenomenon attributed to the nearness of the state to the downstream of both River Niger and Benue (Enete, Obi, Ozor & Mba, 2016). As a result of this Intensity and severity of flooding, Anambra was among the top four States in Nigeriawhere flood was declared a national disaster (NEMA Report, 2018).

Available literature suggests that although flood incidents occur in various parts of the state, the Anambra North Senatorial Zone is the most affected area, where almost five out of the seven local government areas form the

reverine areas of the entire state (Umezulike, 2014). For instance it is on records that the devastating floods of the year 2012, 2017, 2018, 2019, 2020 and 2022 submerged the entire Anambra West and Ogbaru Local Government Areas of the Zone. The same years' incidents affected most communities in Anambra East, Ayamelum and Oyi local government areas (This Day Newspaper, 2014; Okafor, 2020).

The literature is replete with evidence that the incidents of flooding significantly affect the farmers' income, shelter, farmlands, farm produce and food security (Okafor & Ngene, 2022; Aluko, 2022). It was revealed in the literature that the flood disaster of the year 2022, displaced 286,000 persons in Ogbaru, 237,000 in Anambra West, 103,000 persons in Anambra East, and over 5,468 persons were displaced in Ayamelum (Obianeri, 2022). According to Aluko (2022), these displaced persons are mostly farmers who lost their shelter, farmland, farm produce, etc as a result of flooding. This supports the previous discovery by the Agency Report (2018), that flood has destroyed over 200 hectares of rice farm at Omor in Ayamelum Local Government Area as well as the observation of Ajearo (2017) that in addition to displacement and death, flood causes food insecurity among the farmers in Anambra state.

Figure 1:-

Figure 2

Flood Affected Communities in Anambra North Local Government Area

The above figures clearly depict the farmstead and other valuables of farmers in Anambra west, carted away by flood disaster and, perhaps causing severe damage to the farmers and the community at large. This is why this study

remains significant because exposure and compliance to early warning messages may serve as measures of preventing some of the effects of this flood disaster.

Figure 3:- A mature yam farm in Anambra West, submerged in Flood abandoned.

These photographs serve as anecdotal evidence of the prevalent challenges being experienced by the communities who have limited manpower and predominantly use manual means of agriculture. While the rippled effect of flooding robs off on the productivity of the community, it affects their economy and survival. Unfortunately, the farmers lose their crop yield and benefits owing to premature harvesting, occasioned by this incessant flooding (see The Punch, 2018)

One of the prominent effects of flooding in the affected riverine area of Anambra state is the mishaps on water transportation which becomes their only means of movement for people and farm produce in the riverine areas of the state. For example it was reported that over a hundred persons have lost their lives owing to mishaps on water transportation in the riverine areas during the year 2022 flood incidents, particularly in Ogbaru and Anambra West Local Government Area (Obineri 2022; The Sun 2022). This is part of the intention of this study, as the exposure and compliance to early warning messages on this disaster would have helped them manage the situation better.

Early Warning Messages and the Media; Issue of Exposure

Early warning messages are considered in this work as one of the important approaches towards mitigating the effect of flood in Nigeria. This is part of measures for mitigating the effect of flooding across Nigeria (Yussuf, 2020).This early warning, targets individuals, communities and States located in flood prone areas,and are made available to farmers and Agriculturists usually at the onset or the peak of each year's raining season. It usually precedes flood prediction by the Nigerian Hydrological Services Agency (NIHSA) saddled with the responsibility of provision of hydrological information and flood warning and providing useful information about flood annually. For instance, before the devastating flooding of 2012, Nigerian Meteorological Agency NIMET alerted Nigerian government that there would be an abnormal rainfallwhich couldlead to flooding in 12 states, including Anambra (Erekpokeme 2015).

Observably, Information about impending flooding disaster, in form of early warnings once released by the authorities such as Nigeria Hydrological Services Agency (NIHSA), Nigeria Meteorological Agency (NIMET) etc, could get to the target audience. The challenge therefore, is the extent to which audiences pay attention to these messages.

One of the flood early warning programmes, "Annual Flood Outlook" AFO, by NIHSA has become a yearly programe in Nigeria. This was revealed by the Director General of the Agency via a story published by The News Agency of Nigeria(2020), wherein he asserts that the agency "has been producing early warning messages on flood through Annual Flood Outlook, for stakeholders to use and mitigate flood related disaster". It is also observed that Sloganeering is among the means of spreading the flood warning messages in some parts of Anambra State. An instance of this was when Anambra Broadcasting Service (ABS) received prediction of possible flooding in the State and thenstarted airing a slogan "Flood is Coming Again" from August 2019 (Ezebuenyi, Nzeribe & Okoye,

2020). The writers note that the 'voice over' in the slogan highlighted the health implications of flooding and warned the target audience to avoid actions that could trigger flooding in their locations, and stating specifically that communities in reverine areas should make plans to relocate from the flood prone areas as these will enable them to avert risk and damages from flood. Another popular early warning message on flooding is the radio campaigns sponsored by the State Emergency, Management Agency (SEMA), which are often aired on the state owned broadcast media, crusading for safety of the people in flood prone areas. The excerpt below is the lyrics of the radio campaign in question:

"Ọ̀ bụ́rụ́ nà ḿmírí ídē sụ̀bàtà n' ébé í bī, kpọ́ ákàrà 112."
''Safeguard your valuables against flood.''
"Relocate to any IDP camp nearer to you."
"Don't drink or swim flood water."
"Evacuate flooded environment".

These shows the wide spread of early warning messages on flood disaster; using the indigenous languages of the people.Apart from the efforts of the State EmergencyManagement Agency, (SEMA), the National Emergency Management Agency, in its effort towards warning and sensitizing the flood prone communities, selected and trained some persons from the flood vulnerable local government areas in Anambra on the ways of safe guiding their lives and property in the event of flooding and charged them to assist in dissemination of flood warning messages in the areas (Okagbue, 2018 in Ebeze et.al). In addition to this, NEMA usually hold seminars and through the media, they have alerted reverine communities along the tributaries about imminent flood disaster and the need for them to be prepared to relocate to safer areas in the event of flooding (Emecheta, 2018). However, the contention of this work is to examine the extent to which the farmers are exposed to early warning messages as well as their believability and compliance to early warning messages on flood disaster.

Literature in area of flood early warning, suggest that the media are powerful vehicles through which the messages of early warning on flood reach the target individuals and communities. This was reinforced by Ebeze, et.al (2018) when they emphasized that "whenever and wherever there is a suspicion of flood disaster, mass media (radio, television, newspaper and social media) sensitises the public with messages from relevant agencies".

As a result ofthe ability of the media to convey the early warning on flood messages to the target audience, there have been an increase in the number of radio advertisements informing people on how they can prevent floods or keep themselves safe during heavy rainfall or flood events in Nigeria, Anambra State inclusive (Olorunfemi, Olokesusi & Onwuemele, 2015). Also a closer look at Nigerian Major Newspaper have revealed that flood early warning messages or stories do occupy some prominent positions, such as the front page or placed in other important positions. This could be to ensure that the warning captures the attention of the people who are vulnerable to flooding.

Believability and Compliance to Flood Early Warning

The need to believe and heed to the messages on flood early warning is very important for obvious reasons. It can be conceived that believability and compliance to early warning messages, could be effective in mitigating the risk associated in Nigeria (NEMA, 2014). And there are evidence that the government and stakeholders at all levels have been making efforts to ensure that the early warning messages on flood get to people that need it, especially those in reverine communities (Nnadozie 2020,Oyawale, 2022).

From the perspective of Communication Human Information Processing (C-HIP) Models, information must be heard, and confirmed before decision. Result from health promotion communication and Risk Communication studies also reveal that believability factors could be a precursor element to the effects of such communications on the attitudes of the recipients (O'cass & Griffin, 2006; Emery, Romer, Sheerin, Jamiien & Peter, 2014). This implies that a person who perceive himself vulnerable to flood damage, and believe the early warning messages on flood effective on cushioning the flood's negative effect on him could comply with the message. This is idea of Protective Decision Theory upon which this work is anchored.

However, a study by Umoh and Ekperi (2022) had shown that most of the inhabitants of flood vulnerable communities in south Eastern states, and those in riverine area of Anambra State inclusive, seem not to believe the messages of flood early warning.Instead, they seem to usual rely on their age long knowledge about flood

disaster.This could have made them not to comply with warning messages as it was observed that Warnings about expected weather and rainfall patterns as well as imminent risks are often neglected (Efobi & Anierobi, 2013).

The literature had also shown that people's adherence to early warning in Nigeria especially in flood prone areas such as Anambra North is generally low (Nkwunonwo, 2020; NEMA, 2020; The Punch, 2018). Stressing on the damages of2019 flooding incident and issue of non-compliance to flood prediction and early warning messages on flood, Director General of NIHSA, Mr. Clement Nze had called on relevant stakeholders, especially individuals and state governments to heed to flood prediction and the warning issued before the onset of flooding season across the country in 2019" (Agency Report, 2019).

Similarly, Oyewale (2022) expressed the worry by the environments experts who alleged that some people barely adhere to early warning messages, calling on the relevantState Government bodies to expedite action in championing the spread of the early warning messages on flood disaster.This suggest that when the messages do not reach out massively to the entire people or not delivered to them using their languages, there is likelihood for them not to comply or understand the messages effectively

One of the prominent factors that prevent the people from giving adequate compliance to early warning messages on flood is their pre-existing knowledge and beliefs that flooding incident is a usual situation that would eventually recede (Obianeri, 2022). This was further confirmed by the confession of the zonal coordinator, the National Emergency Management Agency, South-East, Mr Thickman Tanimu, who reveled that in spite of sensitization on warnings about the impending flood of 2022, most of the inhabitants of Ogbaru refused to relocate, believing that the flood will recede in due time.

Theoretical Framework

Protection Motivation Theory

This study is anchored on Protection Motivation Theory, propounded by Rogers in 1983, which sought to provide a deeper understanding of how and why people react to impending threats to their health and safety. The theory posits that both individual and environmental factors influence how individuals engage in protective behaviour and that the effects of such factors are mediated by individual cognitive process. The theory further postulates that people, in the face of a given health threat, protect themselves based on four factors: the perceived severity of a threatening event, the perceived vulnerability, the efficacy of the recommended preventive behaviour, and the perceived self efficacy. These factors are further grouped into two appraisal process; threat appraisal and coping appraisal which, in view of the theorist and other scholars, are the causes of adaptive and maladaptive responses to a health threatening situation. According to Rogers (1983), adaptive responses result if the individual perceives himself as being susceptible to a severe health threat and the recommended preventive behaviour as efficient in mitigating the threat whereas maladaptive response result if reverse is the case. In line with this therefore, this theory seeks to help address the extent to which farmers in Anambra North Senatorial Zone of Anambra State, are exposed to early warning on flood being a threat to their health and safety; their believability of the messages as well as their compliance to them.

Empirical Reviews

In 2012, Bimal conducted a study on factors affecting evacuation behaviour. Using the 2007 Cyclone Sidr of Bangladesh as a case study, the study examined sidr victims' responses to cyclone warnings and evacuation orders and the factors that would explain why the victims did or did not comply with the evacuation orders. The study was designed as a survey. Questionnaire was used to collect data from 277 Sidr survivors of the incident who lived in the four most severely affected coastal districts of the area. Results from the study revealed that more than 75% of the respondents were aware of the cyclone warnings and evacuation orders before Sidr Landfall but did not comply. The result further revealed several reasons cited by the respondents for not complying with the evacuation orders to include: lack of trust in the message received, residing in area that is far from the nearest safer shelter and abysmal annual level of education as regards the hazard. This report of Bimal collaborates with Olokesus et al (2011) who reported that more than 90% of 200 respondents, who heard flood early warning in Lagos, ignored the appeal to relocate with poor financial and shelter conditions cited as their primary reason.This present study is focused on flood early warning messages whereas Bimal's study addressed the cyclone warnings and evacuation orders. The two studies are related because they have impending disasters that the safety measures are provided for the people, which requires a positive behaviour change by the people at risk of the disaster.While Bimal evaluation was based

on compliance to evacuation orders and factors affecting compliance, this study examines the believability, compliance and factors that could affect them.

Cumiskey et al (2015) in a study titled improving the social performance of flash flood early warnings using mobile services. The study aimed at ascertaining the effectiveness of using mobile services to disseminate flash flood early warnings in the prone communities in Bangladesh so as to recommend for improve performance of such services. The study employed focus-group discussions (FGDs) and key Informant Interview to illicit answers from selected residents of Sunamganj District of Bangladesh. The study established that mobile services are preferred means of warning communication. The discussants and interviewees strongly preferred voice short message service (SMS) and interactive voice response (IVR) because of easier accessibility and understanding of the message. The study concluded that mobile services is an effective means of conveying early warning on floods in a local area with a strong network and mobile connective. The authors were able to address the effectiveness of using mobile services to disseminate flash flood early warnings in the prone communities in Bangladesh using the KII and Focus Group Discussion, but this present study is focused on the exposure, believability and compliance to flood early warning messages using the Survey design.

A study conducted by Osayomi and Oladosu in (2016) sought to determine the level of Flood Preparedness among households in Ibadan, Nigeria who received flood warnings issued by NIMET when the flash flood of 2013 was imminent. The study explored the level of Awareness of the 2013 NIMET flood warning, the level of subscription to flood insurance, flood risk perception of households and the level of flood preparedness. The study was designed as survey. It employed questionnaire to elicit answers from 275 households drawn from the eleven LGAs that constitute Ibadan.The result showed that only 36.4% of the respondents are aware of the NIMET warning. It also revealed that 35% of the respondents heard flood warning through the electronic/print media while (20%) of them were exposed to the warning through Internet. This was similar to finding of Adelekan (2015) who reported that prior to 2011 flood, a small portion of 4.7% received flood warning from weather forecast in Ibadan. More so, less than 30% of the respondents claimed to be at risk of flooding. The result also showed that preparedness for flood among the respondents was strikingly low at 26.9%. The author contends that cause of low level of preparedness could be as a result of low awareness or that people might have heard the warning but refused to take precautionary measures. They stressed further that frequent public rejection of NIMET prediction as false and unbelievable is also a reason for the apathy towards preparedness. In addition, it showed that it was only 11.6% of the respondents who claimed to be aware of being at risk of flood subscribed to flood insurance. The objectives of this research is almost similar to the objective of the study above, but instead of using warning message from one source (NIMET) this research wish to incorporate messages from other stakeholders that issue warnings on flood. Also instead of using a particular type of flood as a benchmark of its analysis as did by the above author, this research based generally on flood disaster in Anambra North senatorial district.

In 2016, kim, Ikpe and Sawa, analysed the importance of climate forecast information for transhumance pastoralist in Katsina State, Nigeria. The study specifically investigated how pastoralists in Katsina State accessed weather forecasting and early warning information, their Sources of Climate Forecast Information, influence of access to climate forecast information on pastoral adaptation decisions and barriers to utilization of such information. The study used questionnaire and focus group discussion to collect data from 367 pastoral farmers across the LGAs of the State. The study reported that 78% of the pastoralist agreed that it is important for them to have prior knowledge about expected amount and distribution of weather trend of a subsequent season. Regarding awareness, 40% of the respondents claimed to have knowledge of rainfall and temperature pattern in the succeeding season with 30% of them admitting to have got timely warning on drought and violent storms. According to the result of the study, the respondents' sources of information include: modern method and traditional knowledge, farmers' observation. However, more than half of the respondents as reported claimed that they receive weather forecasting information through personal assessment of weather parameters. The respondents also rank radio, as most important channel for accessing information. On credibility rating, 78% admitted that the information was only reliable once in a while. The respondents admitted that the most important decisions to make when provided with timely information and warning on when to migrate, harvest water, collect fodder and choosing animal species. The study equally revealed that lack of timely advance information (42%), inappropriate and non-context specific information (35%), undependability of information (13%) and wide spread illiteracy (10%) were major barriers to utilization of climate forecast information among the pastoral farmers.This research is similar to the one of Kim et al but while Kim et al (2016) looked at how pastoralists in Katsina State accessed weather forecasting and early warning information, this

present study provided an in-depth explanation to what influences all farmers, not pastoral farmers only as studied by Kim et al, (2016).

Using Protective Motivation Theory as a guide, Muktar, Man, Kammarazzaman, Samah and Umar (2018) investigated the ICTs use for early warning reception; its effect on livelihood, resilience and sustainability among fishermen in East Coast Malaysia. A structured questionnaire and focus group discussion were used to gain answers for the research question. Finding from the study suggested, although the respondents use ICTs for social networking, access to extension services, news and entertainment, minority at 22.30% sometimes use same to access the weather information early warning services. Regarding the respondents' sources of early warning, SMS, Social Media, radio, television and authorities were reported by the respondents as sources through which they got early warning information. The report also claimed that radio received the highest rating as the source of early warning information. Findings of the study also validate the claims of Protective Motivation Theory as it suggested that the flood risk communication had impacted on the core constructs of the PMT like threat appraisals and as such motivated the individual to have some impressive level of self-efficacy; however the coping appraisal was seen to be negatively affected by the communication.

Moses, Makebea and Kaisara (2018) investigated the factors which influence the uptake of scientific early warning weather information among small farmers in the Okavango Delta, Botswana. The study was designed as descriptive analytical design and it used a semi-structured Interview and Focus Group Discussion (FGD) to elicit responses from 90. The study found that most of the respondents moderately utilized scientific weather information, while minority of them at 16-7% had low uptake of the message, few had a high uptake of the information. Educational level, age, traditionalism and fatalism were noted by the study as having a significant correlation with uptake of early warning scientific weather information.Specifically, the study further contended that utilization of indigenous knowledge has a strong effects on the uptake of early warning as it showed that a cumulative 86% of farmers were "strongly confident" and confident in the efficacy of local knowledge in weather forecasting, with only a total of 8.9% reported that they were "strong not confidence" and not "confident" about efficacy of indigenous knowledge weather forecasting. However, it reported information channels; radio, town hall meetings, television, print media and agricultural extension agents to have a strong influence on the farmers use scientific weather messages. This study is at par with the findings of (Muktar et al, 2018) where they found that radio still remains the most accessible and used ICTs channel of weather warnings to fish farmers results in a similar study. It became evident that radio could be the highest utilized medium of issuing flood risk communication by authorities.

Alias, Salim, Taib, Yusof, Saari, Ramli, Othman and Annammala (2019), assessed the effectiveness of warnings disseminated to the Malaysian public for the December 2014 Kelantan Flood. Using a ten items questionnaire, the study survey the public awareness and perceptions associated with flood warning and their dissemination. The study found that a majority at 67% were not aware of the early warning system, that majority of the few who were exposed to the flood warning system were through Facebook, they were mostly young people. This was followed by website at 25% and the remaining was through sirens situated near rivers and others. A majority of the respondents 73.2% rated Television highest as an effective medium for warning dissemination, followed by radio, SMS, Local Leaders, newspaper, email and others. Furthermore the study assessed the respondents' action once they received evacuation order during the flooding, majority 72.5% reported to have follow orders and be ready to evacuate, 21.0% said they will evacuate once it reaches dangerous water level, 1.4% resist evacuation and 5.0% do not know. The study concluded that effectiveness of communicating flood warning to the public is highly dependent on the dissemination medium used and that use of varieties can make big differences in the reception and compliance to warnings.

In summary, the literature was able to show that there are results on the exposure of people to natural disaster warnings such as cyclone, Sidr Landfall and flooding in other countries and very few of such studies in Nigeria. It was established that despite the wide exposure of people to the prevalent of flooding, flood damages and flood early warning messages, there is still a noticeable gap on how the farmers in Nigeria particularly in flood prone areas, expose themselves to flood warning messages as well as their believability and compliance to those messages.

Empirical studies also showed that there is exposure by respondents to warning messages on disaster issues as revealed by studies but there are scarcity of results on believability and compliance to such issues. For instance, some existing studies had revealed that many of the respondents were aware of the warnings messages on health and disaster issues but failed to comply. The result of many studies had also shown that preparedness for flood among

some respondents was low and that people might have heard the warning but refused to take precautionary measures.The studies further revealed the preponderance of the radio, Television, SMS and online channels as the most effective means of spreading information on disaster issues and flood pandemic.

Research Method:-

This study employed the surveyresearch design as the quantitative approachbecause of its cost-effectiveness and efficiency in gathering a large amount of information from respondents. The population of the study consists of all the registered cooperative farmers numbering about 11,312 whichspread across 1,123 active Multi-Purpose Farming Cooperative Societies in the seven (7) localgovernment areas of Anambra NorthSenatorialZone, Anambra State, Nigeria. The figure was obtained from the Anambra State Ministry of Trade and Commerce, vital statistics (2021) as presented in the table below:

Table 1:- Population of the Active Registered Multi-Purpose Farming Cooperative Societies and Farmers in the various LGAs of Anambra North Senatorial Zone, Anambra State.

S/N	Local Government Area	No of active multi-purpose farming cooperative societies	No of farmers
1	Anambra East	115	1,032
2	Anambra West	222	2,220
3	Ayamelum	58	1,160
4	Ogbaru	141	1,030
5	Onitsha North	282	2,820
6	Onitsha South	113	1,130
7	Oyi	192	1,920
	Total	**1,123**	**11,312**

Source: Anambra State Ministry of Trade and Commerce, vital statistics (2021)

From the population, four communities each were selected using a table of random digits. These communities are: Eziagulu-Otu, Enugwu-Otu, UmuobaAnam and Igbariam (From Anambra East LGA); Nzam, Oroma-EtitiAnam, UmuikwuAnam and UmuezeAnam (From Anambra West LGA); Ogwuikpele, Akili-Ozizor, Ochuche and Atani (From Ogbaru LGA); and Ifite Ogwari, Omor, Umueje and Omasi-Uno (From Ayamelum LGA).

From these selected communities, four activemulti-purposes farming cooperative societies eachwere selected using a table of random digits. These cooperative societies are: Nwannedinamba, Ivadigo, Otu-Igwe and Igwebuike (from Eziagulu-Otu Community); Ngozika, Divine Chris, Odanduli and Ofuobi (from Umuoba Anam Community); Ogechukwu, Onyeayananwanneya, Ndunisi and Olilika (from Enugwu-Out Community); Focus, Udoamaka, Igbariam Farmers and Peacemaker (from Igbarim Community); Chinazaekpere, Ojobumichie, Ojode and Ukpashojo (from Nzam Community); Ikenga-Oroma, Awuli, Aniasa-Anigwu Beach and Obinwanne (Oroma Etiti Anam Community); Ikemba, Udoamaka, Ukamaka Farmers and Nwannebuife (from Umuikwu Anam Community); Orabuike, Favour, Olisemeka and Otu-Ebele (from Umueze Anam Community);Anulika, Otu-Awele, Chioma and Umumuezigala Women (from Ogwuikpele Community), Evergreen, Unity farmers, Nzemeka and Eziafa (from Ochuche Community) Obioma, Omelusom, Akili-Ozizor and Ezenwanne (from Akili-Ozizor Community); Oganiru, Eze-Azu, Obibuenyi and Ikukuoma (from Atani Community); Egbe na Ugo, Odonye, Golden Star and Udoamaka (from Ifite-Ogwari community); Oganiru, Chidiume, Chisomaga and Ifeanyichukwu (Omasi-Uno community), Nwajiudo, Blessed Unity, Akudinanwa and Umuchukwu (from Omor community) and Iruka, Ezenwanne, Akuchukwu and Ofuobi (from Umueje community).

Meanwhile, the sampling frame consisted of all the 1,123 registered active multi-purpose farming cooperative societies operating in Anambra North Senatorial Zone, Anambra State. To delineate the population, multi-stage sampling procedure was used. At the first stage, the researcher used purposive sampling to select four LGAs which comprised Anambra East, Anambra west, Ayamelum and Ogbaru. The choice of these LGAs was not just because they are known for farming activities, but they are located at reverine areas of the zone and the entire state. The choice was also informed by the observation that these local government areas always have the entire or most of its communities submerged by river flood annually.

A sample size of 372 was arrived at,using Roger Wimmer Sample Size Calculator which has a confidence level of 95% and 4.5% margin of error. However, based on suggestion by Stacks and Hocking (1999, p.217) "the larger the sample, the more representative of the population the sample will be and smaller your error will be." A sample of 500 was decided upon, as the most conservative for a 5 percent error tolerance.Because of lack of statistic on the numbers of farmers in each of the selected farming cooperative societies, the research instrument was divided into16equal proportions of 31 each, foreach of the selected communities, totaling 496. The reaming four was purposefully assigned to the four cooperative contact persons representing each of the selected local government areas.The instrument was administered to the respondents using snowball sampling. This is because there is no information on personal contacts of all the active members of the selected cooperative societies. Hence, reliance on the referrals of the cooperative contact persons and cooperative members the researcher met at the field. Thequestionnaire was used to collect data for this study and descriptive statistics were used in analyzing data that were generated

Results:-

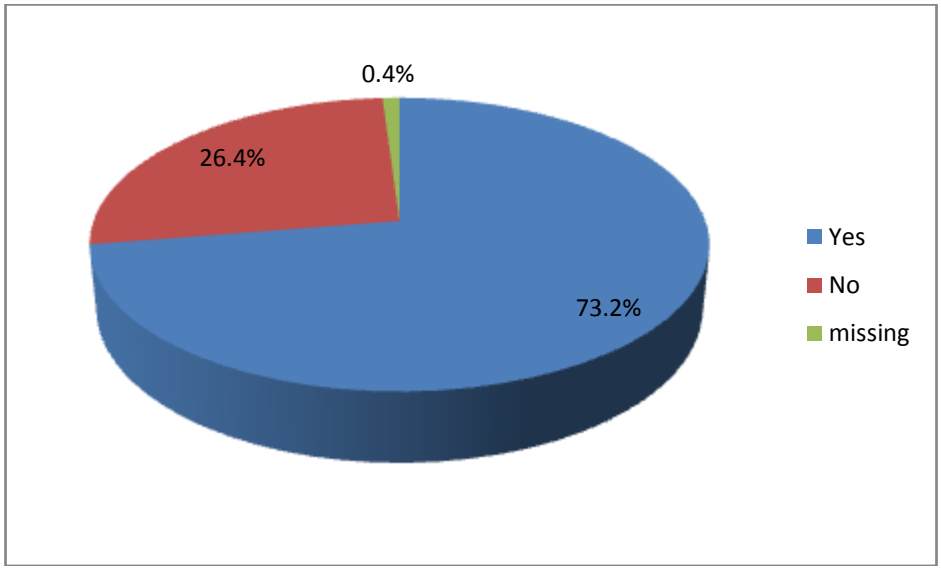

Fig 1:- Respondents' exposure to early warning on flood prior to 2019, 2020 and 2022 floods.

Datafrom Figure 1 above shows that 75.2% of the respondents are exposed to early warning messages on flood prior to the flood incidents of the period under review while a smallernumber at 26.4 % were not exposure to the warning messages. This suggests a high level of exposure to early warning messages among the farmers in Anambra North.

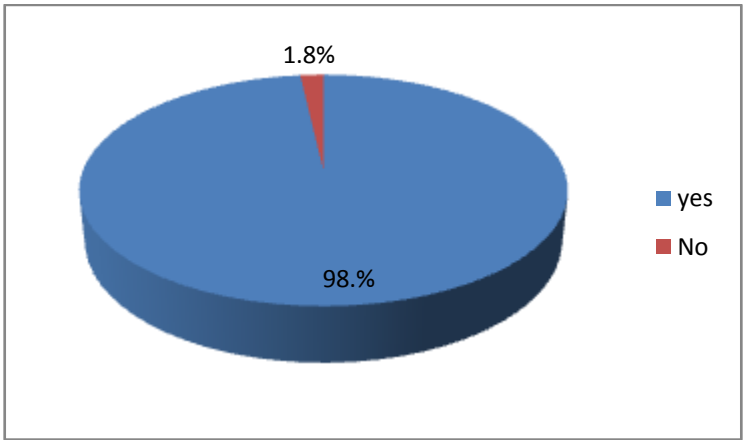

Fig 2:- Respondents' flood experience from 2019, 2020and 2022.

Figure 2 above shows that 98.2% of the respondents have experienced flood disaster within 2019-2022 while a very small number of them at 1.8% have not experienced the flood during the period under review. This indicates that most of the respondents experienced flood during the period of 2019, 2020 and 2022.

Table 2:- Warning Messages the Respondents were Exposedto.

Responses			**Variables**				
	Flood will be severe this year	Clear all the water ways in your area	Flood has reached the dangerous level	Keep your property and valuables safe from flood	Do not swim or wade through the flood water	Do not drink or cook with flood water	Relocate temporarily to any IDP camp closer to you
Yes	92%	86%	36%	75.2%	59%	54%	98%
No	8%	14%	64%	24.8%	41%	46%	2%
Total	**100% N=482**	**100% N=482**	**100% N=482**	**100% N=482**	**100% N=482**	**100% N=482**	**100% N=482**

Source: Field Survey, 2022.

Data in this table showsthe various warning messages on flooding that most of the respondents were exposed to, which may have predicted the intensity and severity of the impending flood and advised the inhabitants of the prone areas to relocate

The table revealed that (92%) of the respondents are to avery large extent exposed the message on the severity of the flood, (86%) of them on the need to clear all the waterways, (75.2%) keeping of the property and valuables safe from flood and (98%) on relocation to IDP camps. Other messages with minimal level of exposure include: the level of flood risks (36%) and avoidance of swimming or wading through the flood water (59%).Findings also revealed that prediction messages on the intensity of the flood and the advice for inhabitants of the vulnerable communities to relocate temporarily dominate the early warning messages on flood, the respondents were exposed to.

However, when quizzed on the frequency at which they were exposed to the flood early warning messages, 93.1% agreed that they were occasionally exposed while 5% had regular exposure to the messages and 1.9% claimed they do not know the frequency at which they were exposed to the messages. Further query on the respondents' primary source of exposure revealed that 60% of them were primarily exposed to the messages through radio; 26% reported town hall meeting with disaster management agents as their primary sourceof exposure, while the remaining 14% claimed they were exposed through other sources. It is from this foregoing that the researcherconcludes that the farmers in Anambra North SenatorialZone of Anambra State were highly exposed to the messages of early warning on flood.

Table 3:- Believe in Early Warning Messages on Flood.

Responses		**Variables**		
	Staying back in flooded environment can cause injury or death to a person	Swimming or bathing with water from flood can cause sickness to a person	Drinking or cooking with water from flood can cause water borne disease to a person	Relocating to an IDP camps is the safest way of reducing the risks associated with flood
Believe	10%	7.1%	20%	15.2%
Disbelieve	90%	92.9%	80%	84.8%
Total	**100% N=482**	**100% N=482**	**100% N=482**	**100% N=482**

Source: Field Survey, 2022

The data in this table indicates that 90% and 92.9% of the respondents said that they did not believe the flood early warning message which says that "Staying back in flooded environment can cause injury or lead to death of the person" and that "Swimming or bathing with water from flood can cause sickness to the person", respectively".

While the early warning messages which say that "Drinking or cooking with water from the flood can cause water borne diseases to the person" and that "Relocating to the IDP camp is the best way of reducing the risks associated with flood" got 80% and 84.2%" disbelieve responses, respectively, among the respondents.This shows a high level of disagreement with the flood warning messages among the respondents. It is therefore understood that the farmers in Anambra North Senatorial Zone hardly believe the communication messages of early warning on flood.

Table 4:- Compliance to Early Warning Messages on Flood as regards their Implementation of its Health and Safety Measures.

Responses		**Variables**	
	Relocated to the IDP camp	Did not swim or bath with flood water	Did not drink or cook with water from the flood
Yes	13.2%	10%	36.1%
No	86.8%	90%	63.9%
Total	**100%**	**100%**	**100%**
	N=482	**N=479**	**N=480**

Source: field Survey, 2022

While respondents had widely experiencedflood in the years 2019, 2020 and 2022, data in the above table shows that 86.8% of them had refused to relocate to IDP camps during the flood, 90% of them did not stop swimming or bathing with the water from the flood as advocated by the early warning message. Data also shows that over 63.9% of therespondents did not stop drinking or cooking with the water from flood during the period. This suggests a high level of incompliance to the messages of the flood early warning among the respondents.The implication is that the farmers in Anambra North Senatorial Zone of Anambra state hardly complyto the early warning messages on flood.

Discussion:-

Findings of this study revealed high level of exposure to the messages of early warning on flood and very low level of believability and compliance to the messages among the farmers studied.For instance, the study revealed that many of the respondents (98.2%)have experienced flood disaster within 2019, 2020 and 2022 and majority of these farmers who experienced flood were found to have high level of exposure (73.2%) to early warning messages on flood prior to the flood events. These collaborates the report by Okafor (2020), Anambra Broadcasting Service (2019), NEMA (2020) and other literature sources that most of the communities in Anambra North Senatorial Zone were submerged by flood during the years under review. The level of exposure recorded in this study is high and much wider than the results of low exposure to warning messages as obtained from Adelekan (2015), Osayomi and Oladosu's (2016), suggesting a noticeable increasein the awareness of flood early warning among Nigerians. The seeming increase could simply be as a result of the geographical or environmentaldifferencesamong respondents in the respective studies.

Despite the high level of exposure to early warning messages on flood, majority of farmers in Anambra North Senatorial Zone hardly believe the communication messages of early warning on flood. They seem not to believe that implementation of the measures advocated by the messages are efficient in curbing the risks associated with flood.

Similarly, there was generally low level of compliance to the flood warning messages among the farmers, in the sense that although majority of them were exposed to early warning prior to the floods of the years under review, only 13.2% relocated to the available IDI camps. These agree with the submission of Olokesuset al (2011) that more than 90% of 200 respondents who heard the warning in Lagos ignored the appeal to relocate.

It was also found that only a few of the respondents (36.1%) had stopped drinking or using the flood water for cooking and only (10%) stopped bathing with the flood water during the period. This indicates that compliance to the messages of flood early warning is relatively low among the farmers.These findings also suggest that there could be a link between believability and compliance. Hence, it could be that since the farmers did not believe the messages of the early warning on flood, they could not processthem further for deeper understanding and positive actions.

Therefore, the fact that the farmers were majorly irresponsive to the advocacies of the early messages on flood could be a product of their disbelief and ignorance of the messages.This affirmsthe position of Protection Motivation Theory (Rogers, 1983) that perception of not being susceptible to an impending threat and not believing on the efficiency of recommended measures could make someone not to comply with a precautionary message. This confirms the relevance of the theory to this work.

Conclusion:-

It can be concluded from the study that high level of exposure to the messages of early warning on flood has not led to reasonable changes in the farmers' behaviuor towards flood risk as intended by the message sources.By implication the Protection Motivation Theory utilized in this work is upheld. The overall assumption of the theory is that individual's response (compliance or otherwise) to any precautionary message such as (early warning) in the face an imminenthealth threat (like flood) is majorly influenced by the person's perception of how severe the threat will be and himself as vulnerable to such threat and cannot cope by any self means. And even when the person perceived himself venerable to the perceived impending threat, the recommended measure must be perceived to be efficient in salvaging the impending situation for the person to take protective safety action, such as temporary relocation, avoidance of domestic use of water from flood among other measures advocated by most of the flood early warning messages usual circulate in Anambra North Senatorial Zone, Anambra State at every inception of raining season. The finding from this study is in agreement with this theory since it revealed that the respondents could not adopt the safety measures advocated by the flood early warning messages despite their exposure to the messages and vulnerability to flood risks. This suggests that there are factors hindering their positive response which could be the confidence they might have had ontheir selves, it could be their perception of flood incidents and flood risks or their understanding of the messages of flood early warning received and the sources of the messages.

Recommendations:-

Based on the findings of this study and conclusion drawn, the following recommendations were made to address the issue of disbelieve and incompliance to early warning messages on flood among the cooperative farmers in Anambra North Senatorial Zone, Anambra State, Nigeria :

1. NIMET, NISHA, NEMA, NOA and other relevant stakeholders should put more efforts towards educating the populace especially farmers on the dangers of staying back in flooded environments. This should be done via radio and interpersonal media such as town hall sensitization workshops, opinion leaders and onsite training.
2. Government at federal and state levels should establish flood-resistant IDP centers in various flood vulnerable communities. This will reduce the high cost and alienation associated with relocating to strange places and will curb the risk of staying back in a flooded environment among the flood-vulnerable communities.
3. National Agricultural Research Institute should introduce early maturing plants for the farmers so that their crops would get mature before the annual flood.
4. NIMET should improve on the accuracy of their yearly flood prediction and inform their targets about any change in prediction made.

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