

FLOOD AND ITS EFFECT ON THE SOCIO-ECONOMIC ACTIVITIES OF OGBARU PEOPLE OF ANAMBRA STATE, 2012-2022

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Abstract

Flood has been an annual problem of the Ogbaru people from time immemorial due to the topography of the area. It is situated beside the River Niger which makes it easier for the flood to have its way without hindrances, thus affecting the socio-economic activities of the people. What are the causes of these floods? What are its effects on the people of the area and what should be done to cushion these effects and promote the socio-economic life and activities of the people for a better living? The study adopted the historical investigative approach for a better understanding of the people and their problems orchestrated by the annual floods. Data for this study were gathered from both primary and secondary sources for comprehensive information on the subject matter. The study found out that the annual flooding of the area since 2012 has left the people of the area impoverished, displaced and most especially prone to outbreak of diseases. The study therefore called on the state and federal governments to come to the aid of the people by providing shelter in the form of upstairs and dredging the River Niger so that the flood cannot overflow its bank to cause destruction. Government should as well convert some of its buildings that houses its infrastructure to upstairs to avoid being damaged by the annual floods. This will safeguard the life and property of the people and enhance their socio-economic life.

Keywords: Ogbaru, Socio-economic activities, Flood, Poverty, growth.

Introduction

Flooding is one of the major environmental crises one has to contend within the country. This is especially the case in most wetlands of the world (Bariweniet al. 2012). The reason for this is the general rise in sea level globally, due to global warming as well as the saturated nature of the wetlands in many parts of the world such as Nigeria. Floods occur on many waters periodically and these rivers overflow their banks as a result of excess rainfall.

Flooding in Nigeria is not a new phenomenon. It is as old as the country itself but what is worrisome about the present flooding is its intensity and level of destruction. For a decade, that is from 2012 to 2022 flood has being the most yearly natural disaster that the people of Nigeria and especially Ogbaru has had to grapple with. The flood of 2012 was a precursor to the present floods with that of 2022 adjudged the highest in both intensity and level of destruction ever. This has called for a lot of questions as to whether these floods are man-made or a natural disaster and why it has being so difficult for the federal and state government to control.

The level of damage and destruction of life and property in Ogbaru local government since 2012 has made the people of the area to be hopeless in terms of their security on yearly basis both in their socio-economic life and personal safety as occasioned by the annual floods. Since 2012, it was only in 2021 that there was no major flood that affected the people of the area which in turn gave them hopes of an end to their yearly nightmare but which the 2022 flood quickly upturned. Floods occur either because heavy rainfall causes rivers to overflow their banks into flood plains or because high tides, possibly combined with large freshwater flows, cause coastal flooding, (this may be



augmented by melting snow). The flood plains affected may be very narrow as in mountainous regions or many miles wide, (Onuorah, 2022).

Flooding is caused by several factors and is invariably preceded by heavy rainfall. The other causes of flooding are moderate to severe winds over water, unusual high tides, Tsunamis due to undersea earthquakes, breaks or failures of dams, levees, retention ponds or lakes, and other infrastructure that retain water. Flooding can be aggravated by impervious surfaces or by other natural and man-made hazards which destroy soil, vegetation that can absorb rainfall. Although flooding is a natural occurrence, man-made changes to the land can also be a factor. In cities and suburbs, pavement and rooftops prevent some rainfall from being absorbed by the soil. These can increase the amount of runoff flowing into low lying areas or storm drain system thereby causing flood. Nigeria as a country is highly prone to natural disasters which flood is the most prominent. But from 2012 to 2022 there have been records of flood and its effect to the Nigeria nation. Prominent among them was that of 2022 which claimed no fewer than 600 lives while 1.3 million others were rendered homeless, (Eleke, 2022).

In Nigeria, flood displaces and affects more people than any other disaster. It also brings about more damage to properties, and interrupts people's social-economic, religions, cultural and educational activities. Flood disaster has been hazardous to communities and institutions in Nigeria. According to Reuters (2012) flood has destroyed both the built-environment and undeveloped plan and taken many lives and property due to its frequent occurrences.

In Anambra state the most affected areas were Ogbaru, Anambra east and west local government areas and Ayamelum local government area. It brought about untold hardship, anguish and sorrow to the population. Increasing flood risk is currently seen as the most vital threat from climate change in many parts of the world, (Dyson, 2002). Studies by Ologunorisa and Tersoo (2006) see extreme rainfall as the major cause of flood worldwide including in Nigeria. Extreme weather condition is also a major factor leading to flood disaster in Nigeria (Aderogba, 2012).

In Ogbaru, the 2022 flood was heavier than that of 2012 which was formerly adjudged the highest and down the line. Agricultural products were affected heavily, which resulted in high cost of goods. Agricultural products, like rice and yam were mostly affected in the study area. The flood affected every community in the area. Recall that Ogbaru as the food basket of Anambra state has 15 communities. All of them were submerged by this 2022 flood leading to the destruction of government infrastructure, farm produce especially those in their early stage of maturity which was cut short by the flood as well as the loss of lives in a boat mishap. In addition, many homes were damaged and some destroyed, thereby displacing millions of people. Socio-economic activities were also affected; so many people vacated their normal homes to different evacuation centers for safety.

Flood is one of many hazards occurring in human environment, its effects are significant both in terms of discomfort, destruction of lives, properties and pollution. The severity of flooding has been reckoned with, by the level of damage done (Williams, 2011). Flooding causes soil erosion as well as sediment deposition problems downstream. Spawning grounds for fish and other wildlife habitat are often destroyed by flooding. Prolonged high flooding delay traffic and interfere with economic uses of lands. Bridges may collapse; structures within floodways damaged, and navigation and hydroelectric power are often impaired. Flooding and its effects have been a major concern to farmers, engineers, economists, educationist among others thus, forming headlines in the world and Nigeria dailies.



Flooding has a wide range of influence on the interactions between man and his socio-economic environment. Flooding, which deposits rich fertile alluvium on agricultural areas, also replenish irrigation channels. In the education sector floods leave a trail of destructions which may results in children's education getting to a level where it cannot be salvaged. Schooling may be cancelled, children may drop out of school and school absenteeism may occur if school buildings are affected or used as evacuation centers. It also disrupts peoples social live such as festival celebrations, business, wedding ceremonies, meetings, and burials when it covers dry land for such activates. Many religions activities will also stop holding why it displaced many to another environment. The above mentioned is typical of Ogbaru situation as its people today counts their losses as a result of the 2022 floods in the area. Based on these stated above, this study seeks to investigate the causes of floods, its effects on the people of the area and what should be done to cushion this effects and promote the socio-economic life and activities of the people for a better living. It also assesses the impact of flood on socio-economic, cultural, religious and educational activities of the Ogbaru people as well as suggests ways to ameliorate the situation.

Theoretical Framework

Theory adopted for this study is the Theory of Urban Resilience to Flood Control. This theory was propounded by Kueil-Hsien. This theory challenges the conventional wisdom that cities cannot live without flood control, which in effect erodes resilience. To operationalize the theory for planning practice, a surrogate to measure the percentage of floodable area is developed for assessing urban resilience to floods. To enable natural floodplain functions to build urban resilience to floods, flood adaptation is advocated in order to replace flood control for mitigating flood hazards. Two key arguments in resilience theory would shift the paradigm of flood hazard management.

First, according to Folke (2003) resilience arises from adapting to inherent variability, uncertainty, and surprise, while Holling and Meffe (1996) opine that human-natural systems lose resilience when the inherent variability is artificially suppressed to promote stability through command-and-control management. This suggests that forcing floodplains to be inundation free and building socio-economic functionality upon forced environmental stability results in resilience erosion. It thus challenges the bias towards maintaining a dry floodplain and steady socio-economic activities. Flood hazard management based on resilience theory would begin with acknowledging periodic floods as inherent environmental dynamics, by which socio-economic activities on floodplains are inevitably affected.

Secondly, resilience theory maintains that periods of gradual development and sudden changes complement each other (Folke, 2006). As demonstrated in frequently disturbed ecosystems, resilience is borne out of experiencing and learning from disturbances (Holling, 1973, Gunderson and Holling, 2002). Research into communities relying on natural resources also indicates that resilience to large, unpredictable disturbances derives from allowing smaller ones to enter the system (Berkes and Folke, 1998, Berkes et al., 2003). This implies that flooding itself is an agent for resilience because each flood experience creates a chance for cities to adjust internal structures and processes and to build knowledge, leading to diverse coping strategies accumulated over time (Folke, et al. 2006). This contrasts with the attitude toward floods as being threatening. As flood-control infrastructure prevents most floods, cities only learn painfully from rare, catastrophic ones with high prices. In the resilience-based flood hazard management, periodic floods are learning opportunities for cities to become better fit for extreme floods.

Overall, resilience theory suggests a paradigm shift in flood hazard management that should focus on building resilience as opposed to maintaining stability because flooding is inherently a part of the normal urban dynamics. Resilience is neither flood resistance nor recovery to pre-disaster conditions both are simply means to an end of stability. This theory addresses the current study



because; flood is a natural disaster that occurs with little or no human knowledge. So the earlier, human adopt strategies that will reduce its effect in his environment, the better for him. Building of structures on floodplains, dumping of refuse on drainages and near waterlogged areas should be avoided in order to help reduce the risk of flooding on our environment. Thus, in Ogbaru Local Government Area, government should help the people to construct drainages and as well build upstairs as a permanent solution to mitigating flood disaster in the area.

Historical Overview of Flooding in Ogbaru Local Government Area

According to oral tradition, we came into existence and met flood, nobody can give account of how it started. In the other way round, it is a seasonal occurrence starting from time immemorial. It occurs frequently on yearly basis. The first stage of floods occurs majorly at the early inception of the month of May till in the Greenwich Time. During this period, the river changes into dazzling colour with beautiful fresh surface overflowing gradually around the river bank, with some in-depth porosity beneath the waters. The Second stage, starting from month of June to July which is the rainy season proper, usually ushers in heavy down pours that tend to increase the river tide gradually around the river banks and beyond. This however is the primary aspect of flood. However, at this initial flood development, the waters begin to swell up gradually around the river banks and extend to island on daily basis but in steady and slow movement. This stage favoured mostly the fisher men as it is the period in the study area when fishes become surplus.

The third stage, starts around the first week of August to the last weeks of October when the rising tide begin to drop gradually and systematically. Before the recession of the floods, there is always about two or three days' heavy rainfall usually in the night and which does not add or reduce the flood tide. This rain is called by the Ogbaru people *Nzogbuiju*, meaning rain to end the flood. About one week before its recession, the rising tide will be stalled. It will neither be increasing nor will it be rising or adding up. By this observation, we know that *ikeagwugoiju* (the flood is tired and is about to recede). From then onwards the flood will begin to recede gradually, slowly, steadily and systematically. The receding of the flood marks the beginning of some lost hopes; this is because the people will go back to fishing in order to at least make some money that will help them get some of the things they lost. They will have plenty of fish available to eat and to sale.

Ogbaru people celebrate their new yam festival during this period. During this period, tubers of yam and other crop produce are harvested. At this point flood signs have started showing all over the place (Ogbonna, 2023). After this period, the flood speed begins to accelerate heavily that it begins to affect farm produce. Farm produce around river line areas are speedily harvested to avoid being damaged by the flood.

Over flooding is a natural occurrence in Ogbaru community on yearly basis but its rising tides varies in velocity depending on the level of rainfall that year which may result in over flooding in some cases as was the case in the year 2012, 2015 and 2018 and that of 2022 which is the highest so far. Since 1945 till date flood has been a serious issue in Ogbaru Local Government Area in particular and Nigeria in general. According to Onyedi Nwanasor, Ogbaru has experienced great flood menace and disaster four times. First, was 1970 flood known as *Ijuogu*. This occurred during the ending of Nigeria/Biafra war. The flood was said to be the first flood disaster that got the people of Ogbaru asking if the world was about coming to an end while some said the gods used the flood to clean the blood spilled during the war (Onyedi, 2023).

Second was 1998 flood *Okeiju*. It was another flooding record that Ogbaru had as they tagged it *Okeiju* (heavy flood) because the flood was unprecedented that water covered everywhere to the extent that people started killing wild animals being chased by the flood. Third was 2012 flood (*Oso Iju*). The greatest flood experienced in Ogbaru before that of 2022. That flood shut down both the economic and socio-economic activities in the local government. The people suffered the menace of



the flood for complete 3 years. The flood kicked off from May till October non-stop. People's houses were covered with water. The people of Ogbaru became refugees in the other Local Government Area. Some people lost their life and some committed suicide as a result of the shock.

The fourth stage was 2022 which is the most recent and highest so far and most devastating. It was measured to be heavier than that of 2012. Agricultural products were affected heavily, which resulted to high cost of agricultural products such as rice and yam. Many people lost their lives, properties worth millions of naira were destroyed. The flood affected nearly 2.8 million people across the country. In addition, many homes were damaged or destroyed, while socio-economic activities were also affected as many people vacated their normal homes to different Internally Displaced Persons (IDP) camps for safety.

Causes of Flood

Most flooding occur when the volume of water in a river or stream exceeds the capacity of the channel. Flooding also takes place along lake and coastal shorelines when higher than normal water levels inundate low-lying areas. Some of the causes include, heavy rain falls and storm that cause river to overflow its banks, obstruction of drainage systems/network, dumping of waste/refuse in drainage and water channels, (Oyewale, 2013). Climate change and Topographical characteristic, Lack of Vegetation, Broken Dams, Melting Snow and Ice etc.

In Ogbaru, flood is caused by its topographic characteristic. Ogbaru lies in a low level area of the River Niger. This makes it very easy to be flooded as soon as the River Niger overflows its bank. There is no man-made activity in the area that is contributory to flooding the area. The National Emergency Management Agency (NEMA) has attributed climate change to the worst flood disaster witnessed in the country, (Sani-Sidi, 2013).

Types of Flood

Urban floods: This type of flood describes a situation where urban centers are inundated as a result of intense rainfall, high total impervious layer (resulting in less infiltration and more surface runoff), flat topography, inadequate drainage networks, obstruction of drainage channels with solid objects etc. Aba, Uyo, Port-Harcourt, Warri, Benin, Lagos etc. are examples of cities that experience this type of flood in different magnitudes (Gordon and Gobo, 2010). Hazards that are associated with these types of flooding are destruction of household properties, public infrastructures such as rail-lines, electricity/utility facilities, hospitals, obstruction of traffic flow, and health issues such as outbreaks of typhoid fever and cholera.

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

Channel Floods: These occur when the natural or artificial banks of any stream or rivers are over topped and spread beyond normal dry land areas. The causes of these types of flood could be associated with dam failures, upstream channel silting, and long duration of rainfall. The annual floods associated with the discharge pattern of the Niger-Benue Rivers systems fall into this type of classification and states in Nigeria that suffer this type of flood problem include Sokoto, Kaduna, Adamawa, Gombe, Taraba, Benue, Oyo (Ibadan), Niger, Kogi, Anambra, Delta, Bayelsa, Akwa



Ibom, Rivers State and etc. Hazards associated with this type of flooding are channel bank failure during flood recession phase and where these occur, houses and villages are swept away besides destruction of farmland and out-breaks of diseases leading to serious epidemics and drowning. It is in this category that Ogbaru falls. Thus every flood year, houses are swept away, farmland and farm produce destroyed and lives lost.

Back Swamps Flood: This is located at some distance away from the stream channels on the floodplain. When water spills over into the floodplains, the heaviest material drops out first and finest materials are carried a greater distance. The fine grained alluvium holds much water and drains slowly creating wetland areas. Back swamps are important sponges that retain water that might cause severe flooding downstream. This type of flood is the most prevalent in the entire Delta State and the Ogbaru area. The flood peaks could be unusually high not only because of the high rainfall during the year and the preceding years but also because of the excessive release of water from dams (Gordon and Gobo, 2010).

Coastal floods/inundation: This is the regular flooding associated with the tidal invasion of creeks and ocean surges on coastal lands. E.g. Bar Beach Lagos, Bonny Coastal lines, Forcados, Okrika Island, Ogu, Opobo Island etc.

Effects of Flood on the People of Ogbaru

Flood has impacted negatively on the people of Ogbaru that the people are already fed up. Every year, Ogbaru are traumatized by the level of destruction they experience because of flood. Many homes are destroyed, farmlands washed away and crops destroyed. Between 2012 and 2022 about 500 lives has being lost to flood in Ogbaru Local government Area. According to Mazi Udenna, (2022) every year from 2012 to 2022, the entire community witness about five to ten deaths in the area. According to him, the whole deaths are not directly caused by the flood itself but its related consequences such as hunger, diseases outbreak, lack of health care resources to help those who are ill as well as shock arising from people losing all that they laboured for the year. For a clearer understanding of the effects of flooding in Ogbaru, we are going to categorise it under the following headings of market, farming activities, education, health, business and religion. This will enable us appreciate the level of effect of flood on the area every year.

Effects of Floods on Ogbaru Markets

With exception of Ogbaru Relief Market, Ogbaru Electronic Market, and Kate Associates, there is no standard market system in Ogbaru local government Area. What they have there is community market where the people sell their agricultural products on market days that is peculiar to the community since farming is the major occupation of people residing in the area. During the flood period, the price of goods and services which is the farm product are affected negatively. Their farm product will be harvested and distributed at once. This makes the supply greater than the demand for such product thus, leading to sharp reduction in the price of their farm products which invariably leads to famine (*ugani*) in the study area before the next farming season comes by. When it is time for planting, the products they sold at relatively cheap price as a result of the flood will be high in such a way that they cannot afford to buy them to plant during the planting season. This will affect the level of input and economic growth in the area according to Obatola (2005).

Due to the fact that governments do not come to the aid of the people during this period, they struggle to get their seedlings at high cost. For instance, during the flood, they sell all the seed yams they gathered since it will get spoilt before the planting season because of lack of storage facilities in the area. Cassava stems will naturally die because of water and rain occasioned by lack of storage facilities. But when it comes to planting season, the price of those items soar very high to the extent

that they cannot afford to buy them or replace the once they lost or sold at cheaper prices thereby affecting their socio-economic life.

Effects of Flood on Business Enterprises in Ogbaru:

The reason Ogbaru does not have many industries, companies and other business enterprises are purely as a result of flood menace. No individual or group of people after seeing how flood stopped economic activities in Ogbaru will still want to continue with the idea of locating his or her business in that area. Many people who tried establishing their own ended up folding it after spending money to repair damages caused by the flood every year.

Effects of Flood on Infrastructures:

In Ogbaru, construction of infrastructures either by the government or individual is limited. The Local Government has low level of infrastructures like, hospitals, schools, roads, electricity and pipe born water. In Ogbaru, the flood kept on damaging the old ones (infrastructures) thus making the people and government not to spend money on building new ones. For instance, the floods between 2012 and 2022 submerged all the government infrastructures such as hospitals, school building, roads, electric poles and transformers. These infrastructures got damage by the floods and government could not replace all of them thereby affecting the socio-economic life of the people. See attached picture of Ogbaru roads destroyed by the flood.



Fig. 1: Residential building covered by flood

Source: Researchers field trip.

Effects of Flood on Academic Activities:

Academic system in Ogbaru and affected areas in the state were grounded by the flood. During this period, flood covers the school building and roads in the local government making the students and teachers to stay at home for about 2 months while academic activities are going on in other Local Government Areas. In fact, the people of the area were forced to have a different academic calendar



in order to mitigate the effects of flood disaster in the area. Students in Ogbaru do not go to school between August and November because of the flood menace which starts from the month of August (the first term of academic session).

In the education sector floods leave a trail of destructions which may result in children's education getting to a level where it cannot be salvaged. Schooling may be cancelled, children may drop out of school and school absenteeism may occur if school buildings are used as evacuation centre. A case in point is on the 2012 flood that happened at the beginning of academic year from July–December, children and teachers failed to go to school because of damaged roads and having to travel across rivers became dangerous. Using boats increased the cost of getting to schools which parents could not afford starting from ending of August to the middle of November nobody went to school. When schools are closed and stay closed longer due to flood disturbances, female learners are further exposed to other risks such as early pregnancies, marriages and prostitution as it was in the case of 2020 Covid-19 lockdown. This menace has remained one of the strongest factors that hampered the standard of education in Ogbaru communities.

Effects of Flood on Farming Activities

Flooding affects several aspects of agricultural production and productivity. There are losses in crops washed down by inundation. In many instances, the crops are unrecoverable after the menace of flood. In areas that are often hit by a flash flood or riverine floods, livestock are lost or displaced including fishes in water bodies or in ponds whose structures are not strong and grazing lands for livestock are lost as well. In Ogbaru local government, farming activities are heavily affected. Starting from July of every year, early farm products of Ogbaru people have started maturing for harvest, but most will still be affected by the flood. For instance, some yams, maize, vegetables may not be affected as they may be harvested before the commencement of flood in August. But majority of farm products are affected, such as cassava, yams, plantain, banana, cocoa yams, rice, pumpkin (*ugu*), potatoes and live stocks etc.

Floods also impede movement of the farmers from visiting their farms to harvest those crops that have already being affected. This is because the roads are flooded and people do not have any means of assessing their farms and its products. Again, those they managed to harvest and store will be destroyed by the flood when the water level comes up to the barn where they were stored. Thus, another problem faced by Ogbaru people in terms of farming is lack of storage facilities. No doubt flooding on farming activities was the brain behind high cost of living in Ogbaru in particular and Anambra state at large. When these crops are destroyed, those who manage to store some of their products will sell it at a higher cost in order to have money to buy those they could not afford. Thus, the effects on farming cum agriculture are enormous.



Fig. 2: Farmland covered by flood

Source: Researchers field trip.

Effects of Flood on Religious and Socio-cultural Activities

The type of flood we are talking about in Ogbaru Local Government Area is beyond people's physical strength and ability. You may have need to practice your faith or culture but you will not see the space to do that. The whole ground in the area is submerged with water. Churches which their buildings are not upstairs cannot hold any church activities, while those who have their places of worship located upstairs cannot access the centre because there is not means of transportation. The only means of transportation is private canoes as there were no commercial canoes and they charge heavily to ferry people around. Thus churches and their members who are struggling to fix themselves with people in the IDP camps have long forgotten and listed church activities as secondary.

Pastors who depend on the free will and people's kind gesture turn to be beggars in order to survive the menace. As for other socio-cultural activities like burials, wedding, festivals and rituals, Ogbaru people at this time have no space for that. People who died during the period are forced into morgues in upland mortuaries for safety. Burials are always fixed at January for the lands to get dried so that the corpse could be buried. Wedding, rituals are always suspended till further notice because flood covered everywhere. This denial of religious, social and cultural activities affected the lives and wellbeing of the people as long life depends on people's ability to enjoy good health coupled with happiness.

Conclusion

So far we have established that flood menace has associated diverse effects both in developed and developing countries. These effects such as socio-economic devastation, property loss, environmental degradation, health issues and untimely death can be reduced if properly managed by



adopting integrated flood management for sustainable development when dealing with flood issues. Also, the above stated measures could be adopted so as to have flood free environment and to achieve a safe, conducive, pleasant, aesthetic environment for living and working conditions.

It seems increasingly acceptable (although not consistently implemented) that flood incidents should not be dealt with through humanitarian relief interventions alone as revealed in this study. There is some evidence to support the argument that there are flood incidents in communities in Ogbaru Local Government Area, just like in other parts of Nigeria. Thus, Flood Risk Management should shift away from traditional response approach to focus on addressing the socio-economic effects of flooding and causes of people's vulnerability to flood menace in order to mitigate its effects by building community resilience for sustainable development.

There are benefits associated with floods to the environment where it occurred. Floods (in particular the more frequent/smaller floods) can also bring many benefits, such as recharging ground water, making soil more fertile and providing nutrients in where it is deficient. Flood waters provide much needed water resources in particular in arid and semi-arid regions where precipitation events can be very unevenly distributed throughout the year. Freshwater floods particularly play an important role in maintaining ecosystems in river corridors and are a key factor in maintaining floodplain biodiversity. Flooding adds a lot of nutrients to lakes and rivers which leads to improved fisheries for a few years, also because of the suitability of a floodplain for spawning (little predation and a lot of nutrients). Again, the availability of fish in Anambra state and its environs all year round has been attributed to the yearly occurrence of flood in the area. Fishes make use of floods to reach new habitats, as well as procreate to have more fish available for the people.

To reduce the effects of flood menace, government at all levels should draft a National Policy on Flood and Erosion control which will help to achieve sustainable systems for managing flood. The policy should focus on preventive measures involving watershed management in order to address deforestation in agriculture and infrastructure development. Finally, residents should adjust to the system by adhering to early warning of flood disaster, early farming and storage mechanism to avert the ugly incidence of flood disaster on their properties.

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