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IMPACTS OF WETLAND DEGRADATION IN NIGER DELTA NIGERIA AND ITS SIGNIFICANCE IN FLOOD CONTROL

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Abstract

Wetlands perform a wide variety of functions that include flood control, ground water recharge, shore line stabilization, storm protection and climate moderation. However, despite these huge wetland functions, it has witnessed poor appreciation and dreadful conditions. Niger Delta has witnessed constant coastal erosion and rising sea level, this has led to large portions of the landmass being eroded. This paper aims to review some environmental effects of flooding in the Niger Delta region of Nigeria to provide the desired knowledge of role that wetlands play in reducing flood impacts. However, having witnessed the flood, the experience opened my eyes to the environmental challenges facing Niger Delta with respect to Wetlands degradation, poor perception of wetland values and functions, poor environmental practices and non-implementation of environmental regulations. This memorable experience rekindled the desire and motivation to seek a solution to wetland degradation with the aim of recognizing significance of wetlands at the centre of achieving both livelihood and biodiversity improvements to address coastal flooding problem.

The study therefore concludes that wetlands are very significant in flood control and thus the conservation and restoration of wetlands, should put in place measures to reduce wetland destruction.

Keywords: Wetlands, Degradation, Niger Delta, Flood, Effects and Flood Control.

Introduction

The World Conservation Strategy has identified wetlands as one of the key life support systems on this planet. Wetlands are considered to be the most biologically diverse of all ecosystems whose formation has been dominated by water, as well as its processes and characteristics. Wetlands are the Earth's most productive ecosystems as a result have been described both as "the kidneys of the landscape", because of the functions they perform in the hydrological and chemical cycles, and as "biological supermarkets" because of the broad food webs and rich biodiversity they support.

Despite this importance, wetlands have witnessed continued loss and degradation due to reclamation of coastal areas, solid waste dump into water channels, lack of canals, and faulty urban planning. This has often resulted in higher frequency and severity of flooding and pollution. In developing countries, floods cause much misery, especially where low-income earners undergo great stress.

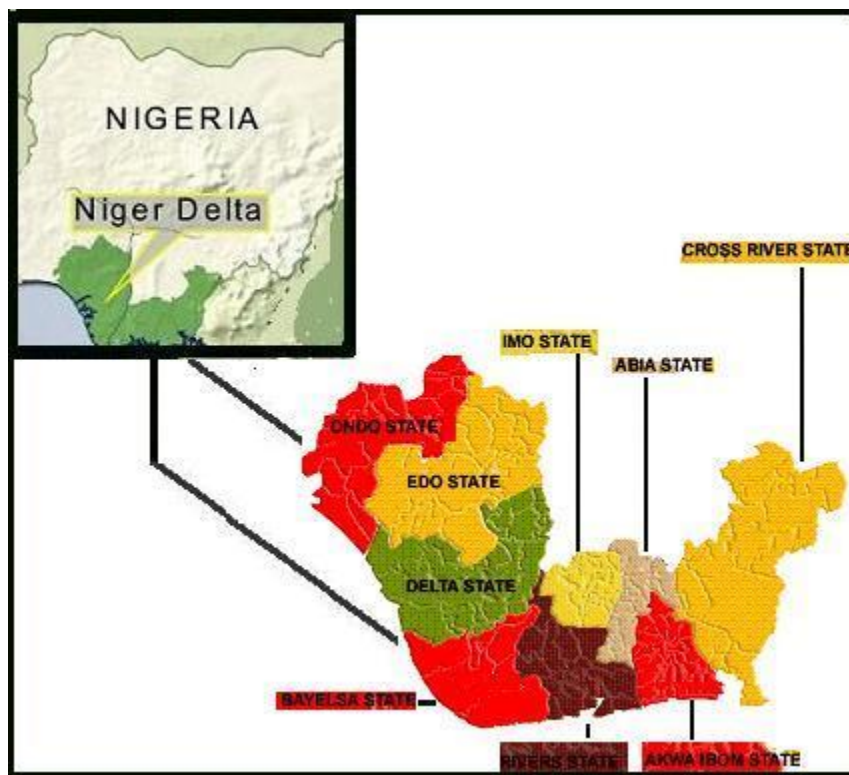
Nigeria is not an exception as a great deal and incidences of flood currently experienced in the country are the resultant effects of wetland degradation in the country. In 2012, the country witnessed rise in sea level which saw several Nigerian coastal states being submerged in waters and floods, this led to the displacement of 2.1 million people and death of over 363 persons across the country. The people living along the flood plains of both the major and minor rivers of Nigeria were mostly affected and this disrupted the life and occupations of the inhabitants such as fishing, farming etc. as well as wreck great havoc on the ecological balance. These have contributed to an overall loss of freshwater biodiversity and inland fishery resources and agricultural productivity of traditional systems and ecosystems long adapted to the flood regime. However, continuing wetland degradation and loss have now reached critical levels in many areas and these trends cannot be allowed to continue. There is need to appropriately recognize wetland functions, increase and promote public acceptance of these functions, to ensure that they are conserved and utilized in a sustainable manner.

Study area

NIGER DELTA

Nigeria is richly endowed with abundant wetlands ecosystem, and it represent 2.6% of the country's area of about 923,768km². The majority of it lies in Niger Delta and is mainly freshwater. Niger Delta accounts for 55% of freshwater wetland in Nigeria and the largest wetland in Africa (Ojekunle, 2011). The region is known for its richness in biodiversity as well as its oil and gas resources. Unfortunately the region has experience a great loss of its inhabitable terrain over the years as a result of unsustainable exploitation of its resources. These incredibly well-endowed Niger Delta wetlands are generally acclaimed for wide range of functions and values in the ecosystem. Wetland is quite instrumental to flood protection and play a critical role in supporting the livelihoods of millions of people in the region (Chidi and Ominigbo, 2010). The destruction of wetland is taking place at an alarming rate. Great

deal of the hydrological and water resources problems currently experienced in Nigeria are the resultant effects of wetland degradation in the country (Nwankwoala, 2012).



Source (<http://nigeriamasterweb.com>)

According to National Emergency Management Agency, the flood disaster that was recently witness across Nigeria in 2012 has been described as the worst in the past three decades which lasted for 5 weeks. Niger Delta will never forget in a hurry the level of havoc caused by the floods. The story is even more pathetic on the people as the overflowing River Niger was particularly hard on them as it carried its furry towards the Atlantic Ocean and practically devastated the people with its raging water, farms were inundated, houses submerged and the people rendered homeless. (Mmom and Aifesehi, 2013)

Flooding and need for wetland restoration

However, owing to the combined effects of droughts and water projects and the associated land use, United Nation Environment Programme alerts that globally, more than 50% of the wetland area has been lost during the last four decades (UNEP, 2007). Aggravating the problem of water management in the country, wetlands which naturally recharge and protect both the surface and groundwater resources, are being unscrupulously degraded at an alarming rate (Uluocha and Okeke, 2004). Greater losses are expected with the projected impacts of climate change. Though, Nigeria contributes less to the global greenhouse effect, the country remains the most vulnerable to the adverse effects of global warming and climate change.

There are ample facts that climate variability and change is seriously affecting Nigeria's water and wetland resources and these impacts on both inland and in the coastal zones are devastating. This was evidenced when the great and unprecedented flood occurred in 2012 in the region. The flood was characterized by submerging many communities and leading to the evacuation and relocation of the people for several weeks. Public infrastructure as road, electricity, telecommunication, buildings were feared to have been destroyed as well as contamination of water, destruction of farmland and livestock, disruption in the economy, in course of the flood. According to the National Emergency Management Agency, a total of 7.7 million people were affected by flooding during the period, of which 2.1 million were officially registered across the country as internally displaced persons. If one portrays the trail of devastations that took place due to 2012 flash floods in all over the country, the noticeable and serious damages can be seen in the Niger Delta region.

Communities and people in Niger Delta region who predominantly dependent on natural resource for livelihood support are finding it difficult to cope with the uncertainties and magnitude of the impacts as a result, poverty has also increased. To alleviate this poverty and sufferings of people displaced by the flood, billions of Naira has been allocated by the Federal Government and donated by well-meaning groups and individuals. Despite the efforts aimed at reducing the devastating impact of the flood, some parts of the country are still under water with many residents unable to live in their homes or run their businesses. Wetland restoration is most effective in reducing flood damage during high-frequency storm events (Shultz and Leitch, 2001).

However, the calamities wrought by the 2012 floods offer our country Nigeria an important window of opportunity to be proactive rather than reactive in addressing difficulties and long-standing development issues concerning wetlands and wetland resources.

Although different Government agencies are active in environmental issues, little appears to have changed over the years in the wetland conversation initiatives. This paper addresses the importance of restoring these wetlands for the purpose of reducing flood damage.

Functions of wetlands

Wetlands perform numerous valuable functions and these values of wetlands are increasingly receiving due attention as they contribute to a healthy environment in many ways (Prasad et al., 2002). These functions are shown below:

Ecological functions	Socio-economic functions
Water recharge, providing natural purification and storage of freshwater for humans and wildlife.	Hunting, trapping and fishing resource base: Many wetland-based enterprises have special economic importance on native communities that depend upon the harvest of waterfowl, ungulates, fish, and fur-bearing animals that thrive in wetland areas.
Wetland protects Natural shoreline from wave action and erosion	Major attractions for tourism and recreation as well as a focus for scientific research and natural heritage areas.

Wetland helps in natural flood reduction and control, through water storage and retention	An important domestic source of peat for horticultural and agricultural applications
It serves as an important source of oxygen, and a vital element of the natural evapotranspiration and Climatic cycles as well as natural storage base for carbon.	Wetlands support the soil base for market garden crops and production of other specialty crops such as berries and wild rice.
It serves as a habitat for a wide range of waterfowl, flora, furbearers, reptiles and fish, preservation of biodiversity and vitality of species.	Wetland is a rich and varied landscape serving as a valued aesthetic resource

Despite the huge importance of wetlands to the nation's ecological and economic health and vitality, the Nigeria wetland have witnessed their continued loss and degradation and this has increased the risk of flooding downstream significantly and progressively over time.

Hydrological functions

Wetland functions like sponges soaking up water during wet periods and releasing it during dry periods (Bullock, 2003). Also when rivers overflow during heavy rainfall periods or spring runoff, the wetlands store excess water. Some wetlands which have a relatively stable hydrology may routinely retain a specific amount of water. During dry periods they may lose some of this water to surrounding parched areas and through evaporation and transpiration. This temporary storage of water decreases runoff velocity, reduces flood peaks, and distributes storm flows over longer time periods, causing tributary and main channels to peak at different times. The ability of wetlands to trap sediments and slow water is reduced. Wetlands associated with Riverine systems serve as floodways, transporting flood pulses from upstream to downstream locations while lessening flood peaks. Flow rates increase in a given stream and the water level rises, wetlands soak up some of the overflow (Negrel et al., 2005). This absorption and storage of excess water lowers the overall amount of flow that would otherwise be carried by a stream.

When the flow of a stream begins to decrease below its normal level, adjacent wetlands drain back into the main stream and augment its flow. These floodplain wetlands work cooperatively with wetlands outside of the floodplain which store flood waters at higher elevations and slowly deliver it downstream. Consequently the water that enters the stream through this process is much cleaner than when it entered the wetland due to settling out of sediments and the biological uptake of certain constituents by the hydrophytic plants and micro-organisms contained in the wetlands (Riekirk et al., 2000). These sites, because of their hydrology, support a wide variety of resources which are significant in socio-economic development. The hydrology of wetlands is central to their functioning and in turn plays a key role in determining the benefits that they provide such as the sustenance of both the

surface and groundwater resources. The source and movement of water are very important for assessing wetland function and predicting how changes in wetlands will affect the associated basin. Wetlands have many important hydrological functions. These include; recharge aquifers; serve as surface water sources for wildlife, human consumption, recreation, agricultural irrigation, and industrial processes; and act as cleaning filters for the water that passes through them.

Wetlands and flood control

Wetlands reduce flooding by holding back peak water flows when water levels are high and, in some cases, storing water within the wetland. This results in more gradual discharges of water over a longer period of time, which can protect downstream property owners from flood damage.

The potential of wetland storage for reducing peak flood flows is recognized as one of the most poorly understood functions of wetlands. Wetlands are a central component of the hydrological cycle, performing economically and environmentally valuable functions to regulate water quantity and quality such as retain water during dry periods, keeping the water table high and relatively stable and during periods of flooding, they mitigate flood and to trap suspended solids and attached nutrients (Bondar et al., 2007). Unfortunately, these wetland important roles in flood protection have been destroyed in Nigeria. Flooding is one of the major environmental crises Niger delta has been facing within the century. The region was one of the worst hit victims of the 2012 floods. Flood height rose up to 3.2 metres in certain places with very swift flow or velocity, sweeping away both live and properties, destruction of social and economic infrastructure and degradation of already fragile ecosystems (Mmom and Aifesehi, 2013).

Damage due to flooding occurred because these floodplain areas whose natural function is the provision of both storage and conveyance at times of high flow are used for purposes that do not take account of the flood risk. Wetlands reduce flooding by holding back peak water flows when water levels are high and, in some cases, storing water within the wetland. Well-managed ecosystems such as restoration and protection of wetlands can provide natural protection to reduce the destructive potential of flooding (Bariweni et al., 2012)

Ecosystems, such as wetlands, forests and coastal systems, reduce physical exposure to natural hazardous (as landslides, flooding, avalanches, storm surges, wildfires and drought) by serving as natural protective barriers or buffers and thus mitigating hazard impacts.(Kamble et al., 2013).

The reactive approach to flood protection in Nigeria has led to millions of Naira being spent on the construction of embankments, flood walls and culverts and these structures only move large volumes of water downstream faster, causing flooding elsewhere.

Restoring wetlands and reconnecting floodplain wetlands with rivers can be an effective means of tackling flooding problems in Nigeria.

Conclusion

Wetland hydrologic and water-quality functions are the roles that wetlands play in modifying or controlling the quantity or quality of water moving through a wetland. Niger Delta region is naturally vulnerable to flood and have suffered several flooding; many of the people have not recovered from the flood losses. This perennial flooding experienced in the region is as a result of wetland degradation. The Major solution to reducing the severity of the flooding that occurs in the Niger Delta, however, is wetland conservation and restoration. Although there are many functions of wetlands, as listed above, society does not always affix a value on those functions. The fact that wetland values are overlooked has resulted in threat to the source of these benefits. The greatest impacts are on the people directly residing with the vicinity. Future approaches to flooding are expected to be proactive, as wetland restoration and preservation is an important component of a comprehensive flood protection strategy, this offers protection against the twin impact of climate change and human activities. Sustainable wetland management is a good approach that will reduce flooding by regulating flood peaks and delaying peak flow.

On the premise of the findings of this study, it is recommended that for achieving any sustainable success in the protection of these wetlands, the study also recognizes that the prevention of the destruction of wetlands cannot be achieved through regulations alone; awareness among the general public, educational and corporate institutions must be created. This will help the general public to understand that its true value are significantly higher than its perceived and that if more communities protect existing wetlands and increase the quantity of wetlands through restoration, we will be better protected against the consequences of floods.

It also recommends that management of wetland must be an important part of integrated water resources and flood management of all river basins.

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