

The Prospect of Flood Management in Nigeria

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Flood is the most common of all environmental problems and has posed a big threat to lives and properties, and thus constitutes socio-economic and environmental consequences across the globe. Smith (1996) asserted that flood claims over 20,000 lives per year and adversely affects around 75 million people world-wide. In Nigeria, There has been a dramatic rise in the frequency and magnitude of flood disasters, threatening large populations living in diverse environments and causing socio-economic damages including loss of lives in recent years. The focus of this research work is to highlight the socio-economic and environmental problems posed by flood in Nigeria and to assess the prospects of management and control of this environmental hazard hence disaster management involves systematic observation and analysis of disasters to improve measures relating to prevention, mitigation, preparedness, emergency response and recovery.

Keywords: flood disaster, environmental hazards, socio-economic damage, flood management and control.

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Introduction. Flood is a high water level that overflows the natural (and or artificial) levels along any portion of a stream covering land that were usually dry and beyond its banks. Flood is said to be among the most devastating natural disasters in the world, claiming more lives and causing more damage to property than any other natural disaster. In the past four decades, economic losses due to floods disasters have increased in folds and have also resulted in major loss of human lives and livelihoods, destruction of economic and social infrastructure, as well as environmental damages. (Munich, 2002) hence it is a serious threat to sustainable development. Countries around the globe are experiencing increasingly severe flood disasters. For example, the 2010 floods in Pakistan were described as the worst in that country's history, affecting 20 million people. In the same year, floods in Colombia displaced over 400,000 people. The same environmental disaster affected Russia tremendously.

The Table 1 shows flood disaster in some countries that claimed lives with death toll as high as 1000 and above. The 1931 flood disaster in China is said be the worst ever recorded in human history claiming about 3,700,000 lives.

In Nigeria, At least 20 per cent of the population is said to be at risk from one form of flooding to another (Punch, 16th June 2013). Over the past few years, the country has faced an unprecedented flood disaster resulting in loss of lives and property running into billions of naira. Flood in Nigeria has destroyed both the built up environment and the natural environment. In 2010, the National Emergency Management Agency (NEMA) reported that over 250,000 Nigerians were displaced by flood disasters that ravaged many communities across the country including farmland and productivity estimated at millions of naira. In 2012, Nigeria experienced the most threatening natural disaster in 50 years – the 2012 flood disaster. About 7.7 million people were affected and 2 million people rendered homeless (Shuaib, 2012). The situation of the affected people were awful and miserable whereas the socio-economic and ecological loses were so huge that it could not be quantify.

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Table 1: Some deadliest flood hazard worldwide,
showing events with death toll at or above 100,000 individuals

Death toll	Event	Location	Date
2,500,000-3,700,000	China floods	China	1931
900,000-2,000,000	Yellow river (Huang he) flood	China	1887
500,000-700,000	Yellow river (Huang he) flood	China	1938
86000-231000	Banquet dam failure	China	1975
230,000	Indian ocean tsunami	Indonesia	2004
145,000	Yangtze river flood	China	1935
100,000+	St. Felix's flood storm surge	Netherlands	1930
100,000	Hanoi and Red river flood	North China	1971
100,000	Yangtze river flood	Vietnam	1911

Source of data: USEPA, 2002 [23]

Table 2: Statistics of the 2012 flood disaster in Nigeria

States/ Regions	Local govt. Area	No. of people affected	No. of people displaced	No. of people dead	No. of people injured	No. of people missing	No of camp residents	Homes destroyed
Adamawa	6	20544	15879	24	233	0	5147	5740
Taraba	6	15193	12440	3	23	0	8058	3344
Plateau	2	2096	1645	3	22	0	0	329
Benue	4	12420	7801	5	5	1	5992	2183
Kogi	9	72725	30709	19	314	1	28764	12452
Niger		9935	1789	32	76	0	1030	278
Edo	3	54269	39602	10	178	0	30855	1854
Anambra	10	64487	43350	1	1	0	43134	621
Delta	8	52421	29635	18	15	0	27264	0
Bayelsa	8	118601	73917	1	0	0	73917	0
Total	56	422691	256767	116	867	2	224161	26801

Source of data: Nigerian Red Cross Society (NRCS) [8]

The Table 2 shows the destructive statistics of the 2012 flood hazard in Nigeria which is said to be the worst ever recorded in Nigeria. Over 7million people were affected in one way or the other in different states/regions.

Causes of flood in Nigeria could be classified into two – the natural cause and the anthropogenic cause. See figure 1 below.

Coastal flooding occurs in the low-lying belt of mangrove and fresh water swamps along the coast. River flooding occurs in the flood plains of the larger rivers. Flash floods are associated with rivers in the inland areas where sudden heavy rains can change them into destructive torrents within a short period.

Urban flooding occur in towns located on flat or low lying terrain especially where little or no provision has been made for surface drainage, or where existing drainage has been blocked with municipal waste, refuse and eroded soil sediments. Extensive urban flooding is a phenomenon of every rainy session in Lagos, Maiduguri, Aba, Warri, Benin and Ibadan cities (KesienaEtuonovbe, 2011).

Impacts. The impact of flood in Nigeria can be seen in two different forms – impact on the natural environment and impact on the built environment (urban area). The impact on built

areas is far more devastating in nature due to human activities and increased population. The general effect of flooding is very intense both in magnitude and impact. Its occurrence has constantly reduced land use and property value thus causing a rise in the cost of living. Similarly, flood disaster affects the economic growth of the affected region. The direct and indirect effects on the local and national economy may lead to a reduction in the family income and a high cost of repair for the tangible loss – (loss as a result of damages arising as a consequence of the physical contact of flood water with property – direct losses- and the losses which are consequent upon direct flood damage – indirect losses). For intangible loss (loss of life, ecology, injury and damage cause to human health and long-term well-being), they are extremely difficult to quantify in economic terms and are mostly irreparable. Again, flood hazards is said to create conditions that promote secondary treats of waterborne and vector borne diseases that could cause respiratory diseases. Bruce (2003) identified the possibility of human illness syndromes associated with flood related hazards.

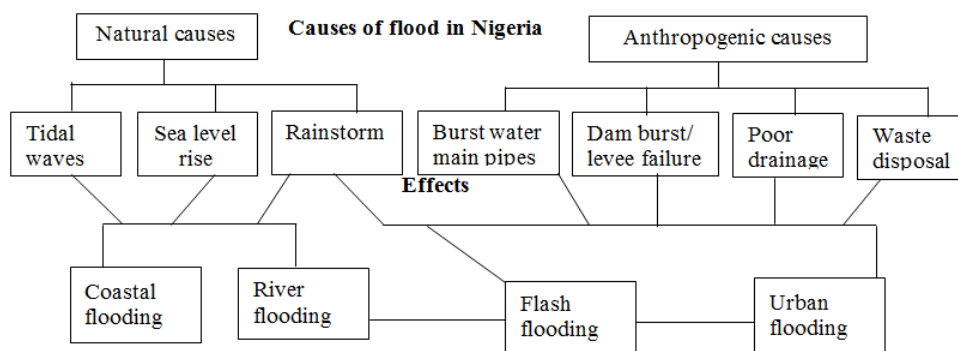


Figure 1: Causes of flood in Nigeria
[Figure constructed by author. Source of data: Kesiena E., 2011]

The menace of flood in Nigeria has continued on the increase in later years. Subsequent occurrences tend to be higher in magnitude and effects. In his work, Aderogba (2011) showed the characteristics of flood from 1981 to 2021 projected year. See figures below.

Figure 2 further shows selected parameters of flood as observed in Nigeria between 1981 and 2011 – a period of thirty years – and a projected parameter from 2011 to 2021– a period of ten years.

The parameters include: Average number of major occurrences – (A); average heights in meters – (B); average spread (width) in meters – (C); average relative cost of loss of properties in millions of Naira – (D); average number of lives claimed – (E); and average amount of relief package that had to be expended in millions of Naira – (F). These parameters have been on the increase astronomically from 1981 to date. For example, the number of major occurrences that affected major cities and towns, claimed lives, disrupted economic and social activities were just 16 in 1981 but by 2011, it increased to 46 and if it continues unabated, it is projected to be 55 by 2021. (See Figure 2A). The same goes for all the other parameters. (See figures 2 B, C, D, E, F). How then can this phenomenon be abated, managed or controlled.

Flood management and control in Nigeria

Flooding is having a major impact on millions of people every year and therefore flood risk management measures need to be implemented in the short term. Since man cannot fully

control the climate and other natural causes of flood, there is need for urgent and systematic preparations which would help mitigate the impact of flood (Afiesimama, 2008). Afiesimama line of argument is that perspective to control or at least minimize flood vulnerability on human activities, lives and properties should be provided. Nigeria traditionally has relied on structural measures – heavily engineered interventions to control floods which include

- Planting vegetation to retain extra water (greening measures);
- Terracing hillsides to slow flow down hills;
- Construction of floodways (channels) to divert floodwater;
- Building of levees, dikes, dams, reservoirs or retention ponds on floodplains.

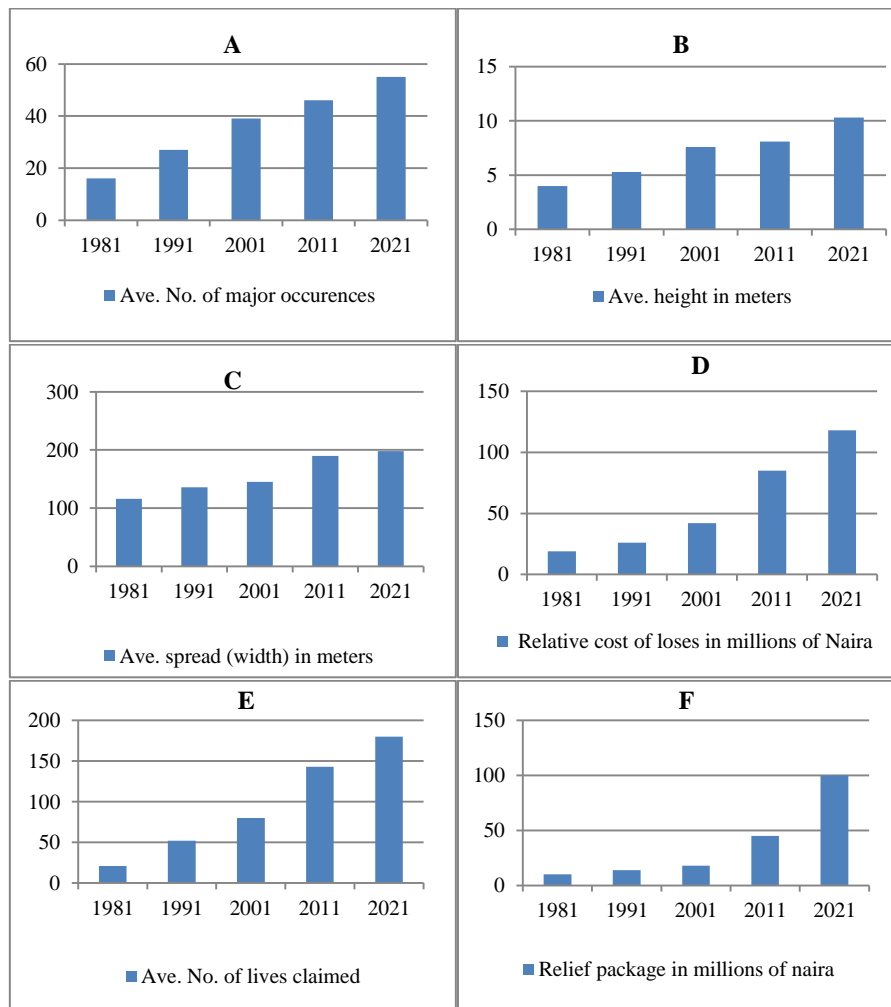


Figure 2 (A, B, C, D, E& F):
 Observed and projected selected parameters of flood in Nigeria
 [Source of data: Aderogba, 2011]

However, as floodplains have become more densely settled due to population pressure, rapid urbanization, and unprecedented socio-economic development flood damage has risen, despite major public investment in structural flood control measures. Thus cities have expanded into surrounding plain land where standards of flood protection are lower. Drainage systems in many city centres have become out of date, while the value of assets and property at risk has escalated.

However, to ameliorate flood vulnerability in Nigeria, an integrated flood management approach should be adopted. This approach is a collaboration of different methods aimed at control and management of flood and its after effects. This strategy reflects a shift from dependence on structural measures to a balanced approach using both structural and non-structural measures. Impacts from flooding are growing and may become much worse in the future. Schemes must balance the short and long term and integrate structural and non-structural measures (see figure 3).

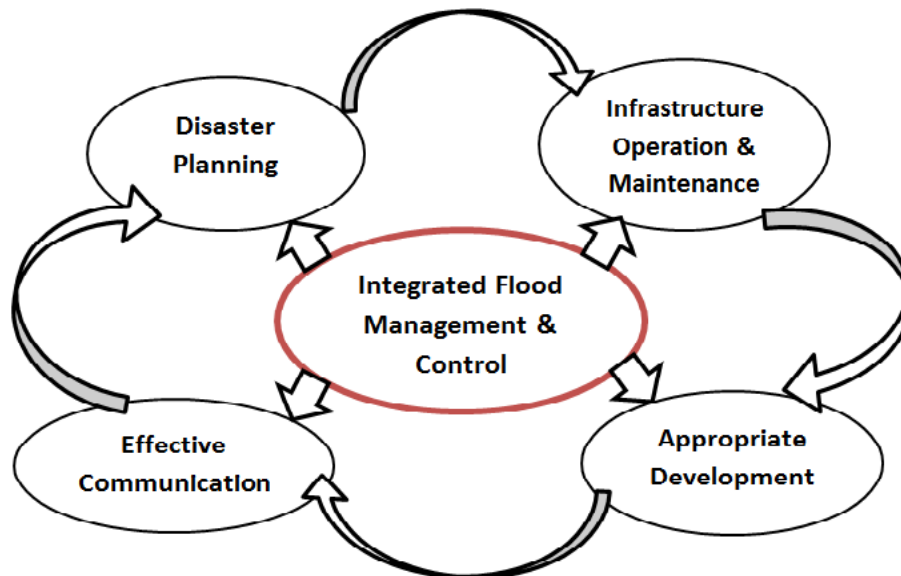


Figure 3: Integrated Flood Management method
[Source of data: Wood, 2007]

Disaster planning entails engagement of the community at risk and encouragement of citizen preparedness, planning ahead and putting the appropriate machineries in place to handle and ameliorate the effect of the hazard.

Infrastructural operation and maintenance involves building and constructing the necessary structures to curtail the vulnerability of hazards especially in flood prone areas and maintaining existing ones.

Effective communication deals with creating awareness giving information about flood through flood monitor instruments. For example constructing a flood-frequency curve based on historical records and an examination of vegetation to determine how often on average flood of a certain size occurs in a particular area.

Appropriate development include Land use planning and regulation of new development, addressing the issue of unsustainable development plans that leaves an area prone to flood

hence anthropogenic factors like urbanization and development has increased the prospect of flood hazards.

In implementing an integrated approach, the role of well-functioning institutions, the participation of stakeholders, and the engagement of affected communities are vital. Integrated flood management limits the damages on properties and threat to human lives and other species. In Nigeria, as in many developing countries, many people depend on small-scale farming. Consequently improved flood management will directly improve the livelihood of people and lead to poverty reduction by sustaining incomes.

Conclusion. Vulnerability and the social consequences of flooding depend on prevailing economic conditions, housing and education, the standard of governance, and existing public infrastructure and services. Poverty, low standards of housing and poor governance make communities more prone to the adverse impacts of flooding and thus more difficult for them to recover from natural disasters. The transition from flood control to integrated flood management presents challenges. It demands a raised awareness and changed consciousness about the role of non-structural flood management measures and the social and eco-environmental dimensions of flood management. It also demands a new way of implementing and integrating flood and water management within existing organizational structures that will require greater partnership and coordination. Thus, engagement of the community at all stages of risk assessment through implementation to evaluation will contribute to the success of measures and would generate extra knowledge and resources, as utilization of measures that are community-designed and implemented.

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Перспективы регулирования паводков в Нигерии

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Наводнение, в соответствии с Resonzweig (2009), может быть определено как неестественное накопление воды над землёй, обусловленное высокими приливами, обильными осадками или быстрым таянием ледников. Это перетекание или вторжение большой массы воды на территории, как правило, непокрытые водой. Наиболее серьёзные паводки случаются в прибрежных районах, где, как правило, проходят проливные дожди и плохая структура почвы (пойма). Наводнение является наиболее распространённой из всех экологических проблем и создаёт большую угрозу для жизни и быта, и, таким образом, оказывает социально-экономические и экологические последствия по всему миру. По Askew (1999), одна треть всех смертей, треть всех травм и одна треть болезней во всем мире в той или иной мере связаны с наводнениями. Аналогично и Smith (1996) утверждал, что наводнения уносят до 20 000 жизней в год и негативно влияют ещё на

около 75 миллионов человек во всем мире. В Нигерии наводнения принесли больше вреда, включая жизни и быт, чем любое другое стихийное бедствие, которое испытывала страна. Произошёл резкий рост частоты и масштабов стихийных бедствий, угрожающих большим группам населения, проживающих в различной местности в последние годы. Эта угроза усугубляется отрицательным воздействием человека на окружающую среду, следовательно, наводнения могут быть вызваны нерациональным поведением человека и значительными изменениями в окружающей среде. Неизменным остаётся тот факт, что последствия наводнений настолько серьёзны, что страдающие общины или человек должны реагировать, принимая исключительные меры. Эта проблема вызывает растущую озабоченность в Нигерии и в мире в целом. В центре внимания этой исследовательской работы является освещение социально-экономических и экологических проблем, возникающих в результате наводнений в Нигерии и оценка перспектив управления и контроля этой экологической опасности. Борьба со стихийными бедствиями включает в себя систематическое наблюдение и анализ стихийных бедствий, с целью улучшения мер, связанных с предотвращением, смягчением последствий, обеспечением готовности и реагирования на чрезвычайные ситуации, а также последующее восстановление.

Ключевые слова: наводнение, экологические опасности, социально-экономический ущерб, регулирование и управление паводками.

Перспективи регулювання паводків у Нігерії

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Повінь, відповідно до Resonanzweig (2009), може бути визначена як неприродне накопичення води над землею, обумовлене високими приливами, рясними опадами або швидким таненням льодовиків. Це перетікання або вторгнення великої маси води на території, які, як правило, непокриті водою. Найбільш серйозні паводки трапляються в прибережних районах, де, як правило, проходять проливні дощі і погана структура ґрунту (заплава). Повінь є найбільш поширеною з усіх екологічних проблем і створює велику загрозу для життя і побуту, і, таким чином, спричиняє соціально-економічні та екологічні наслідки по всьому світу. За Askew (1999), одна третина всіх смертей, третина всіх травм і одна третина хвороб у всьому світі тією чи іншою мірою пов'язані з повенями. Аналогічно і Smith (1996) стверджував, що повені забирають до 20 000 життів на рік і негативно впливають ще на близько 75 мільйонів людей у всьому світі. У Нігерії повені принесли більше шкоди, включаючи життя і побут, ніж будь-яке інше стихійне лихо, яке відчувала країна. Стався різкий ріст частоти і масштабів стихійних лих, що загрожують великим групам населення, які проживають в різній місцевості останніми роками. Ця загроза посилюється негативним впливом людини на навколишнє середовище, отже, повені можуть бути викликані нерациональним поведінкою людини і значними змінами у навколишньому середовищі. Незмінним залишається той факт, що наслідки повеней настільки серйозні, що страждаючі громади або людина повинні реагувати, приймаючи виняткові заходи. Ця проблема викликає зростаюче занепокоєння в Нігерії та в світі в цілому. У центрі уваги цієї дослідницької роботи є висвітлення соціально-економічних та екологічних проблем, що виникають в результаті повеней в Нігерії та оцінка перспектив управління і контролю цієї екологічної небезпеки. Боротьба зі стихійними лихами включає у себе систематичне спостереження та аналіз стихійних лих, з метою поліпшення заходів, пов'язаних із запобіганням, пом'якшенням наслідків, забезпеченням готовності та реагуванням на надзвичайні ситуації, а також подальше відновлення.

Ключові слова: повінь, екологічні небезпеки, соціально-економічний збиток, регулювання та управління паводками.

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