

Substantive Causes and Effects of Floods in South Western Nigeria and Sustainable Development of the Cities and Towns

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Abstract

Recent floods and consequences all over the world are becoming too frequent and threat to sustainable development in human settlements. The objective of this study is to examine the substantive causes and selected effects of floods in south western Nigeria with a view to identify solutions for sustainable development. The work is limited to the cities and towns of the region. Read literature on floods. Flood occurrences and effects in major cities and towns of the region were observed and studied for thirty years. Living habits of the urbanites were studied. 6 monarchs and 240 other urban dwellers were interviewed. Documentaries on radio and televisions were listened to and used. Records of physical planning were perused in the Ministries of Physical Planning and Environment/Infrastructure in the states of the region. No city or town of the south western Nigeria is absolutely free from floods in any year. The number of occurrences, magnitudes, affected areas and adverse socio-economic consequences have been increasing over the years. Living habits of the urban dwellers, urban policies and programmes, government concerns and others have been unsustainable. There must be pragmatic physical planning and sustainable living habit of the urbanites. Otherwise, with global warming, the effects of floods in the region may be more grievous.

Keywords: floods, urban dwellers, cities and towns, south western Nigeria, sustainable development.

INTRODUCTION

Occurrence and reoccurrence of prolonged heavy rain showers and the resultant floods all over the world in the recent time are becoming concerns to research and governments, (Christopherson, 1997; ActionAid, 2006; Adeaga, 2008; Aderogba, 2011 and 2012, Pilgrim and Cordery, 1993; and Wright, 2011). Particularly in the rainy seasons, it is usually common story to read about in the dailies and magazines in United States of America (Dow and Dowling, 2006; and Kersh and Simon, 2005); Pakistan and India (Wright, 2011); and even in Nigeria, (Taiwo, 2011; Akanin and Bilesanmi, 2011; and Aderogba, 2012a and 2012b). The frequency of this phenomenon is no longer news worthy at some instances. There are three schools of thought about the preponderance of floods all over the globe especially in the tropics. The first is of the opinion that there is global warming and climate change that is directly and or indirectly increasing the amount of rain and ice melting that is increasing the amount of runoff. In this case, the only source of water that results in great runoff, (floods), in West Africa, and indeed, south western Nigeria, will be rain water. The second school of thought is of the view that there have been a lot of abuses heaped on the physical environment of man; and that the environment is only responding to the abuses heaped on it. The abuses include but not limited to poor planning of the physical environment,

poor management of wastes, inadequate drains for the built up areas and others. The third school has it that it is the combination of both global warming and climate change, and the abuses of man on the environment that are the causes of prolonged and torrential showers of rains and the resultant runoff that lead to devastating floods in America, Europe and Africa –including Nigeria; and south western Nigeria. The facts behind the three schools are yet to be thoroughly researched and confirmed, (Dow and Dowling, 2006 and Kersh and Simon 2005).

There have been journalistic and non-quantitative reports of flood for several parts of Nigeria. But they are superficial and lack directions for professionals and policy makers (Aderogba, 2011). The works of Taiwo, (2008), Amaize, (2003), Babalola, (1997), Atdhor, Odjugo and Uriri, (2011), British Broadcasting Corporation, (1999) and Mordi, (2011) are in this category. They are generic in analysis of data and information; and in the recommendations for sustainable development. Above all, there is none, of recent, to describe the magnitude and criticality of the phenomena with the attendant challenges. The works of Adeaga (2008), Oyegbile (2008) and Oyebande (1990 and 2005) are paraphrasing, disjointed or sectional. Adeaga (2008) is only on mapping of the hazards caused by flood in the North Eastern part of Lagos Metropolis. Similarly, the work of Aderogba

(2011) on the *Challenges of Global Warming and Floods in Lagos Metropolis, Nigeria* is only an expository of the poor planning of the physical environment of Lagos Metropolis and poor living habit of the residents *vis-a-vis* the resultant floods. Probably because the entire nation requires attention for sustainable development in the face of incessant floods, (Akosile 2008; Adeaga 2008 and Aderogba *et al* 2012), the study of Aderogba (2012) *Qualitative studies of recent floods and sustainable growth and development of cities and towns in Nigeria* is on the entire country. But there are needs to examine into details, the situations of different regions of the country such as the south western part of the country with the multiplicity of urban functions; and the peculiarity of urban growth, processes and developments in the region. The region contains about 20% of the nation's population; and about 47% of industrial establishments, (National Population Commission, 2007 and Mabogunje, 1968). It is the growth pole of the nation; its growth and development needs to be sustainable.

Therefore, the objective of this work is to study the peculiarity of the incidences of floods and identify the substantive causes and effects in south western region of Nigeria with a view to adduce solutions for sustainable development in the region. Emphasis is on the cities and towns of the region.

The South Western Nigeria

The South Western Nigeria, the Study Area, lies within the tropical region of West Africa. It is define by longitude 3° 20' and 6° 20' East and latitude 6° 18' and 9° 11' North. The region metamorphosed politically from the Colony and Protectorate of Southern Nigeria to Western Region, Western State; and today, it is made up of Ogun, Oyo, Oshun, Ekiti and Ondo States. Lagos Protectorate, now Lagos State, is part of the region. The region is bounded in the north by Kwara and Kogi States, in the east, by Edo State, and in the west by Benin Republic, See Figure 1. The southern boundary is the Bight of Benin with a maritime claim of about 27.65% of Nigeria's. It is a region of contrast. The relief is lowland in the south, from the coast with an average height of between 0 and 200m above sea level. Inland, it is predominantly Yoruba (sometimes referred to as Kukuruku) highland that is in ranges culminated to the height of about 750m above sea level. There are bounhadts that dotted the vast topography. Ogun, Oyan, Oshun, Owena and Osse and their tributaries are the major rivers that drain the region southward into the ocean. Aside these, there are drainage channels and canals, natural and man-made, of various lengths and capacities that drain the cities and towns. Supply of water into these channels are from rains, seepage from the ground, springs, waste waters from homes, hospitals and maternity homes, manufacturing plants, hotels, motels, brothels and

recreation centers, car wash centers, schools and colleges, research institutions and others. But over 75.50% come from rain water, (Aderogba, 2012).

Human activities such as dam construction, irrigation, bridges and others have negatively impacted on free flow of water in the drainage channels, rivers and streams. Particularly at the urban centers, construction of roads, buildings, factories, manufacturing plants, bridges and culverts, farmlands and others have reduced drainage channels and erosion passages and or diverted the natural courses of others. The climate is tropical continental: On the average annual rainfall is 3000mm over Lagos in the south and not less than 2,500mm in other parts of the region. Temperature is 26°C, on the average, throughout the region. The vegetation follows the pattern of rainfall: It is Salt water mangrove followed by fresh water mangroves that are found along the coast. The rest of the region is dominated by high rain forest with stratified vegetation, derived savannah with tall grasses and thick backed trees; and guinea savannah to the extreme north, in that order. However, the vegetations have been cleared for cultigens; and in the cities and towns for roads, railways, airports, industrial development and other urban activities and functions.



Figure 1: Map of Southwestern Nigeria

The cities and towns are characterized by multiplicity of urban functions that have to do with Government and administration, tourism and recreation, research and education, marketing and sales and so on. Industrialization is concentrated at the Lagos-Ota-Abeokuta-Ibadan Axis where the largest manufacturing, assembling, chemical, bottling and other industries are located. Labor, skilled, semi-skilled and unskilled and markets for the products and services are readily available too. The population

of the six states put together is 27,511,992, (19.65% of Nigeria's). It is made up of 14,049,594 males and 13,462,398 females, (National Population Commission, 2007).

The assembly and manufacturing industries, schools, colleges and research institutes, markets and commercial centers, hospitals and maternity homes, recreation centers, hotels, motels and brothels, restaurants and bars, chemicals and food processing plants, households and others release and dump solid (degradable and non-degradable) and liquid wastes into the immediate and distance neighborhoods indiscriminately. In these ways, the drainage channels, canals and erosion passages are blocked inadvertently and or deliberately.

Waste generation and management are challenges to both governments and urban dwellers, (Mabogunje, 1987, Oyebande, 2005 and Aderogba, 2010). Potable water is also a challenge. These thus call for bottled and sachet waters (and of other drinks) the packs, cans and sachets of which are indiscriminately disposed in quantities by households, recreation centers, parks, public places and others. The quantities and spreads in every community are good indications of the extent of deity habits of the urbanites, (Mabogunje, 1987; and Oyebande, 2005). According to them, these have adverse environmental consequences at both urban and rural areas. The drainage channels, erosion passages and canals have been most affected.

METHODOLOGY

Literatures on torrential rains, floods and consequences were read. Topographical maps of selected communities were studied. Flood parameters were studied in selected 25 cities and towns for a period of thirty years. All the sampled cities and towns were toured to study the characteristics and behavior of floods in the drainage channels before, during and after rains. Measurements were made of the width, height/depth, and others of floods. Flood plains were also studied. Photographs were taken of the floods and flood plains; and studied. 6 monarchs, one from each state; and 240 urbanites randomly selected from each state of the region responded to questionnaires that contains twenty four questions. They responded to questions on the frequency, spread, relief packages, number of human lives lost, estimated cost of lost properties and others during and after floods. The respondents also gave their views about the advantages of floods; and panacea to

challenges of floods in the urban centers for sustainable growth and development. Local, national and international radio and television documentaries on floods were listened to and watched. Both Federal and States' Ministries of Physical Planning and Environment/Infrastructure provided information and data on the physical environments, rainfall pattern, floods and floodable areas and the roles of the urban dwellers in city physical planning; and waste management. Though all the sampled cities and towns were toured to study the characteristics and patterns of flood in the drainage channels before, during and after rains, the rains of the weeks of 10th July, 2011 and 25th June, 2012 that resulted into massive floods across the region provided specific substantial and substantive parameters of the floods. No rigorous statistical analyses were carried out but, simple tables, charts, photographs and graphs were generously used to analyze and depict the findings. The work is limited to the cities and towns of south western Nigeria. Geomorphologic, climate and hydrological concepts were minimally referred to for clarity of purpose only. Global causes and effects of floods in each city and town of the region were limited to other works.

RESULTS

22 causes were adduced and the randomly selected 240 urban dwellers responded to it. Each respondent picked more than one cause. See Table I. Illegal structures on/across drainage channels, canals and mere erosion passages (100%), inadequate drainage channels (100.00%), outright blockage of canals/drainage channels (100.00%) and torrential rain storms (100.00%) are the major substantive conservative causes of the floods. Others are land reclamation/encroachment (82.08%), collapsed dams/embankments and bridges (95.42%), construction and reconstruction (92.25%), poor physical planning (92.25%), and nature of terrain (96.24%). Poor waste management (100.00%) is also a common challenge. Ocean/Lagoon surge is picked by 75.58% of the respondents. See Table I.

However, the aforementioned led to the observed (and projected) flood parameters and antecedents. See Figure 2. Average heights/depth, width/spread, frequency and the durations floods lasted are shown with Figures 2(a), 2(b), 2(c) and 2(d) respectively. Figure 2(a).

Table I: Substantive Causes of Floods

Substantive Causes	No of Respondents	% Proportion
Illegal Structure on / across Drainage Channels	240	100.00
Land Reclamation/ Encroachment	221	92.08
None-heeding to weather forecast	91	37.92
Poor Physical Planning	222	92.25
Inadequate Drainage Channel	240	100.00
Global Warming	201	42.08
Blockage of Canals/ Drains	240	100.00
Negligence	22	21.67
Government Policies and Programs	202	84.17
Collapsed Dams/ Embankments	229	95.42
Nature of Terrain	231	96.24
Torrential Rain Storms	240	100.00
Base water flow	56	23.33
Water Flows from Car Wash Centers	31	12.92
Spring Water Flow	59	24.58
Watering Flowers/ Farm Irrigations	21	8.75
Construction & Reconstruction	222	92.25
Illegal channelization of Drainage Channels	207	86.25
Social/Cultural Activities	86	35.83
Ocean/Lagoons surge	191	78.58
Poor Waste Management	240	100.00
Others (Specified)	201	83.75

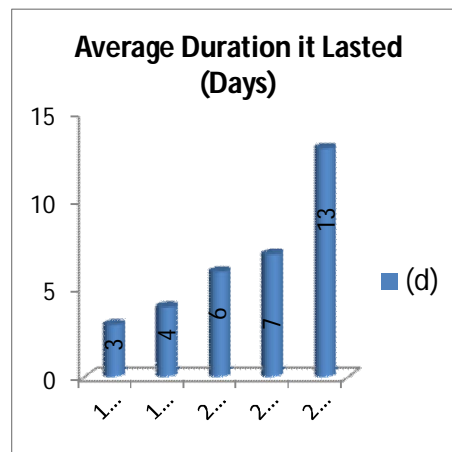
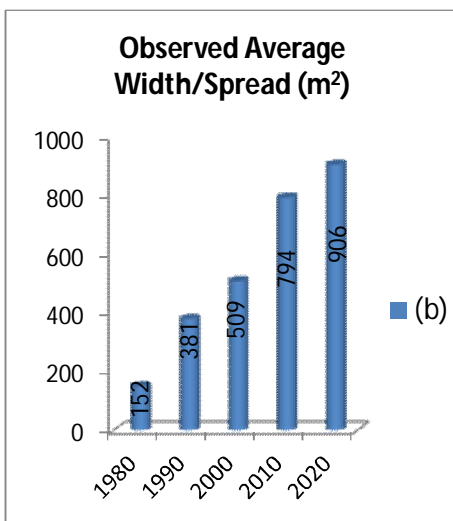
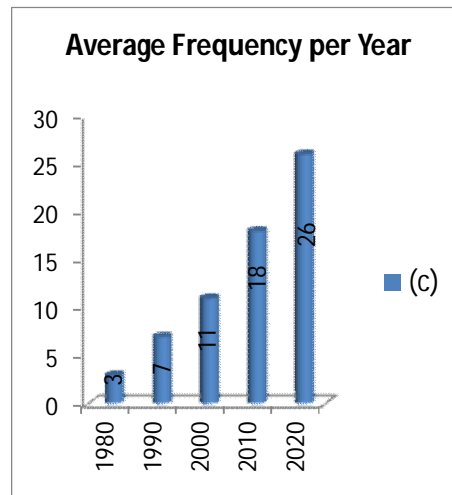
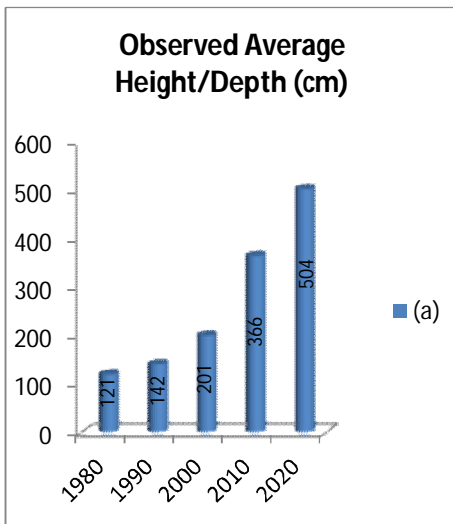


Fig. 2: Observed and Projected Selected Parameters of Floods (1980 – 2020)

The average height/depth has been consistently increasing over the years from 121cm in 1980, to 142 cm in 1990, 201cm in 2000 and 366cm in 2010. It is

projected that it may increase to 504cm by 2020 if the spate remains unabated; see Figure 2(a). Similarly, the average width/spread was just 152m in 1980. It became 509m in 2000 and 794m in 2010. Again, the spread may be as much as 906m in 2020. See Figure 2(b).

Average frequency per annum increased from 3 in 1980 to 18 in 2010; and it may become 26 per annum in 2020. See Figure 2(c). Figure 1(d) summarizes

average duration floods last: In 1980, it was three days. In 2010, it became one week (7 days) on the average. Duration may increase to almost two weeks (13 days) in 2020, that is, if the spate should remain unabated.

Incidentally, flood has become almost permanent feature of some localities – that is, as long as the rainy season lasts. Communities thus live with it.

Table II: Substantive Flood Parameters in Selected Cities and Towns

City/Town	Average frequency per year	Cost of Lost (₦)(M)	Average width (m)	Cost of Relief M (₦)	Average Depth /Height (cm)	Av. No. of Days Lasted	Estimated Existing Channels/Drainage
Ile-Ife	6	16	121.00	61	223	11*	36.45
Oshogbo	8	18	111.00	48	357	13	41.56
Ede	4	16	94.00	35	201	4	40.35
Ilesha	8	21	94.00	42	361	6	39.50
Lagos Metropolis	10*	102	747.00	207	271	25*	45.20
Ikorodu	3	22	118.00	34	184	5	46.65
Badagry	4	30	104.00	29	201	4	47.10
Epe	3	25	124.00	24	195	4	46.66
Ibadan	3	88	521.45	145	368	11*	43.22
Oyo	4	25	104.00	45	206	4	41.25
Ogbomosho	8	18	118.00	47	277	11	45.42
Igbo- Ora	2	5	84.00	21	142	2	21.45
Akure	3	6	101.00	52	194	4	44.15
Ikare	3	4	92.00	27	198	3	43.25
Ondo	8	18	124.72	35	290	11	35.67
Owo	3	11	101.00	21	162	4	25.56
Ado Ekiti	2	6	118.00	16	141	5	48.75
Ise Ekiti	3	24	96.00	19	136	3	13.56
Ido Ekiti	6	12	117.00	22	137	2	12.15
Erinjiyan	5	4	85.00	47	144	2	12.15
Ijero Ekiti	4	6	88.00	37	139	2	28.85
Abeokuta	6	31	115.05	74	366	8	36.52
Shagamu	4	5	101.00	23	220	5	35.55
Ijebu- Ode	4	3	97.00	28	161	4	33.45
Aiyetoro	3	3	86.00	19	143	3	15.56
Mean	4.68	20.76	146.48	46.32	216.68	5.24	35.20

*It is now permanent feature as long as the rainy season lasts in some communities.

Table II is an array of the average frequency per annum, cost of lost in Naira, average width in meters, average relief packages in Naira, average height/depth in centimetre and average number of days it lasted for each of the 25 cities and towns. Average frequency per annum is 4.68 times in a year. Cost of lost is ₦20.76million; average width is

146.48meters; relief package is ₦46.32 million; height/depth is 216.68cm; number of days it lasted is 5.25; and estimated existing drain is 35.20% of the requirements. See Table II. The average frequency is as high as 10 per annum in Lagos Metropolis and 8 per annum at Oshogbo, Ilesha, Ogbomosho and Ondo. It is lowest at Igbo-Ora (2) and Ado-Ekiti (2). Estimated cost of lost is highest in Lagos Metropolis (₦ 102 million) and Ibadan, (₦88 million). It is least at Ijebu-Ode and Aiyetoro, ₦3 million each. Average width was least at Erinjiyan, (85.00m), Aiyetoro

(86.00m) and Ijero-Ekiti (88.00m), but highest in Lagos Metropolis, (747.00m). Apart from Ijebu-Ode (97.00m), Ise Ekiti (96.00m), Ikare (92.00m) and Ede (94.00m), there is no other sampled city or town where it is less than 100.00m on the average. See Table II. Every year, affected communities have been relieved with Relief Packages by individuals, communities, Corporate Organisations and governments. Average Relief Package is highest in Lagos Metropolis, ₦207 million. It is lowest in Ado-Ekiti, ₦16 million. Average depth/height at Ibadan (368cm), Lagos (271cm), Abeokuta (366cm) and Oshogbo (357cm) were the highest. The lowest heights were observed at Igbo-Ora (142cm), Ado Ekiti (141cm), Aiyetoro (143cm), Ido Ekiti (137cm) and Ijero Ekiti (139cm). See Table II. It lasts for 11 days on the average at Ile-Ife, Ogbomosho, Ondo and Ibadan. At Oshogbo, it lasts up to 13 days but in Lagos it can last for as many as 25 days; and further observation shows that it has become permanent feature in some localities, that is, as long as the rainy season lasts.

There is none of the cities and towns that have up to 50.00% of the built-up areas connected with drains. The most connected are Ibadan (43.22%), Ogbomosho (45.42%), Ado-Ekiti (48.75%), Akure (44.14%), Epe (46.66%), Ikorodu (46.65%), Badady (47.10%) and Lagos Metropolis (45.20%). It is less than 20.00% at Aiyetoro (15.56%), Ise Ekiti (13.56%), Erinjiyan (12.15%) and Ido Ekiti (12.15%). In other words, estimated existing drains - canals, drainage channels and erosion passages - natural and manmade in the sampled cities and towns is less than 50.00% in all the sampled cities and towns. Average for the entire region is just 35.20%. See Table II.

Appendices I, II, III, IV, V and VI show different parlous sceneries of floods. Specifically, Appendix I shows a flooded community in Lagos where commuters are lashing through the flood; and the others helping themselves with canoe. Appendix II shows a flooded Petrol Filling Station at Akure (in Ondo State); and the surroundings, to a radius of about 110m, submerged in flood. Appendix III shows commuters and commercial vehicles submerged in flood in Surulere area of Lagos. Traffic flow was halted and disrupted for days. Appendix IV shows a completely flooded community and a school girl wading through flood water, in fair, to access her flooded place of abode in Lagos. Appendix V is a scene of drowning urban dwellers, neck deep, in flood water while good Samaritans are attempting to rescue them out at Abeokuta, Ogun State. There were similar scenes at Ota in the same week in the southern part of the state. Appendix VI is a flood plain after six days of flood at Challenge, Ibadan leaving behind a shadow of the community who lost everything they had to the flood of July 2011.

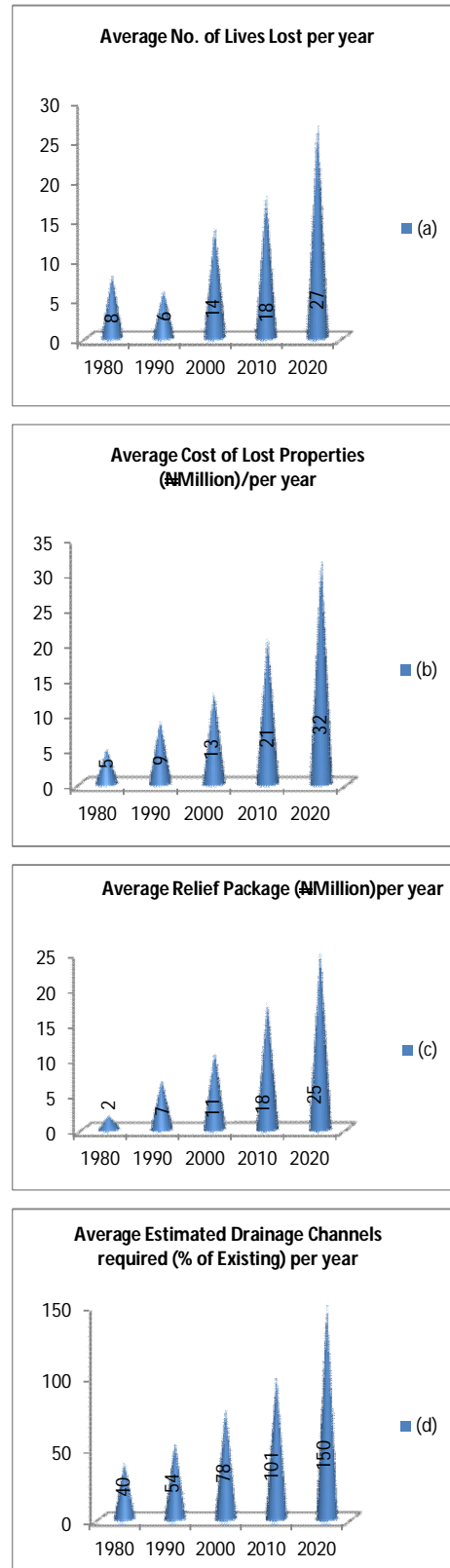


Fig. 3: Estimated and Projected Selected Effect of Floods (1980 – 2020).

Figures 3 (a), (b), (c) and (d) show a trend analysis of selected estimated and projected effects of floods: the number of lives lost has been increasing from 8, on the average in 1980 to 14 in 2000 and 18 in 2010. It only decreased to 6 in 1990. It is projected that the number may increase to 17 by 2020. See figure 3(a). Average cost of lost properties by individuals, families, households, governments and corporate organizations was ₦5 million in 1980, and ₦21 million in 2010. See Figure 3(b). It is projected that it may increase to as much as ₦32 million by 2020 if the spate should continue unabated. Over the years, relief packages have been paid to individuals, groups, households and communities, Fig. 3(c). The average relief package was only ₦2 million in 1980 but it was as much as ₦18 million in 2010. 2020 projection is ₦25 million. Average Estimated Drainage required was just 40.00% of the existing drains; the requirement increased to 78.00% in 2000 and 101.00% in 2010; and it may be as much as 150% by 2020. See Figure 3(d).

DISCUSSION AND CONCLUSION

The region has come a long way with multiplicity of functions of the cities and towns as centers of administration, commerce, education, tourism, trade, culture, industry, finance, economy and others, but not with commensurate infrastructural development. The region contains about 19.65% of the Nigerians living in Nigeria and a host of other nationals resident and or working for their livings in Nigeria. Urban functions kept on increasing and so also rural-urban migration of skilled, semi-skilled and unskilled unabated. Floods in the cities and towns are becoming common phenomenon whereas it is not a welcome scene because of its destructive and devastating effects. Hitherto, the cities and towns experienced floods that come and last for weeks on roads, streets, lanes and crescents; and sometimes became permanent features of some communities. The pattern changed in the recent past to flash floods whereby the flood will come and disappear in less than three to four hours in few locations. There is a third phase: Following torrential rains, floods now come leading to threats to urban lives; loose of lives and property and rendering thousands of residents homeless; changing the face of the earth and disrupting the unsustainable traffic and others. The intensity – heights, spread, frequency and havocs are increasing by the years. It has become permanent futures of some communities as long as the rainy season lasts. The rains of the weeks of July 10th and 11th 2011, and June 17th 2012, for example, took the residents by surprise: The flood took over, shut down and grounded the economy and incurred agony on the residents and governments. Houses got submerged, collapsed and washed away. People, including school children, motorists, and traders trapped and groan in traffics. Kiosks, culverts and bridges washed away. Farmlands, bridges and culverts, roads, railways,

schools and colleges, hospitals and maternity homes, residences and others were submerged and washed away. Families were forced to relocate, businesses were paralyzed; and lives of animals and human beings were lost.

The entire ecosystem of animals, plants and man were altered: Habitats of animals and plants were affected: Insects, reptiles, rodents and vermin were driven out of their natural habitats, sought alternatives and became dangerous to man and other animals. Urban dwellers had rethink about their places of abode relative to positions of drains and natural landscape. The incidences call for attention of authorities such as the State Governments, Lagos State had to declare holidays for the public schools. It may be said to be next to Tsunami. For some days, it became major news item in the national and international dailies and magazines. Air time of radio and television stations were generously devoted to the news on flood, for two weeks after the incidences. The living habits of the residents, poor planning of the physical environment, none conformance to the natural physiographic characteristics of the landscape and general poor living habits of the inhabitants – at homes, manufacturing industries, offices, markets and stores, workshops, recreation centers and so on leave the drains blocked leading to floods. Canals and drainage channels have been silted and filled up with sand, plastic cans and bottles, sachets of pure water, carrier bags and others that will never degrade. Drainage channels, erosion passages and so on were often blocked or, at best, narrowed by physical buildings, construction and reconstruction rubble; and or by various activities of the urban dwellers.

Individuals and groups, organizations, businesses, and even governments are not abiding by the environment laws. It may certainly not have been as enormous as it were if the drainage channels were adequate and there were no blockages of the existing drains. It has not been recognized by all that each house or drainage in any street or along any road is part of that community. The last 30 years have experienced considerable physical development - construction and reconstruction of roads, offices, markets and stores, manufacturing industries and others without any appreciable infrastructures such as drainages, roads and canals to support them. These are environmental challenges that need to be addressed towards sustainable development. It must be remembered that annual floods have been promoting settlements based on thriving agricultural communities in river valleys. Egypt that gave rise to the whole civilizations that depended absolutely on the fertile silt settling on floodplains of River Nile is a case in point. Though, it is risk dwelling along flood plains. However, it is imperative that concerted efforts are made to put a check on the incessant flood insurgencies and put into better use the better parts of

floods and flood plains. If the cities and towns will stand the test of time, meet the Millennium Development Goals and perform the urban functions to the admiration of the urbanites, the challenges of floods must be faced head on. It should be remembered too that global warming and climate change is a world-wide challenge. All hands must be on deck to challenge the global phenomenon.

Towards averting the annual tragedy of floods often occasioned by torrential rains and living habits of the residents, the three tiers of government should step up rehabilitation activities that would ensure major roads and drainage channels across the cities and towns are free of encumbrances; and serviceable. The Ministries of Works and Infrastructures of each state should be tasked by their respective state Governments to ensure adequate free drainage channels and erosion passages in all nooks and cranny of the states. The Ministry may have to enforce the drainage clearing through "persuasive approach", while the city governments beef up supervision of any identified problem areas.

Residents, manufacturing industries and assembly plants, offices, markets and stores, hospitals and maternity homes, schools and colleges and others should be compelled to ensure that their surroundings, the drainage channels and erosion passages are clean, clear and free of refuse before, during and after rainy seasons. That is, everyone must cultivate the habit of weekly clearing of drains in his surroundings.

Specifically, it is imperative that the national monthly environmental sanitation exercise is enforced and sustained. The exercise may be observed at more regular intervals to rid homes, work environments and others of filth made up of waste waters, plastic junks, waste foods, abandoned/condemned home utensils and appliances, unserviceable tools and equipment and others, and properly disposed of them without necessarily hindering free flow of water along erosion passages, gutters, drainage channels and canals. There must be urgent government interventions to remedy the situations in the cities and towns to save them from more serious calamity. There must be dredging and re-dredging of canals and drainage channels. Government is the only authority that can identify illegal structures and dismantle them. It is better late than never; and the time is now to clear the drainage channels, canals and erosion passages of illegal structures and silts.

Green Areas, besides urban rivers, streams, canals and other drainage channels should be encouraged and enforced. The management of River Basin Development Authorities should be magnanimous enough to provide the engineering and technical solutions that can effectively take care of floods in their respective areas of jurisdiction. Following from

above, urban Physical Planning Departments should not be oblivious of global warming and consequences on climate change - more torrential rains, increased run offs more floods; and the inadequate drainage channels. Weather forecasts and forecasters should be more proactive to weather events that could lead to torrential rainstorms that may subsequently result in floods, and havocs. There must be legislations that must deal with the use of plastic bottles and cans, sachets, such as pure water sachets, carrier bags and other non-degradable material not only in the urban centers but throughout the region and in the whole country. Residents, as groups and as individuals, and corporate bodies should be implored and encouraged to embark on some palliative measures such as dredging and re-dredging of drains, erosion passages and so on; and construction of embankments and channelization of some routes that are prone to flood. While canals may be further opened and widened, side drains and gutters could have removable precast concrete or steel cover for ease of maintenance. Governments should deploy reasonable human and material resources to free all floodable areas across the built-up areas from incessant floods before, during and after rains; and should be conscious of floodability of new suburbs.

Physical planners and policy makers should know that natural disasters such as floods have destructive power; could be very sudden, occasional and so on. These therefore are pointers to appropriate planning and forecast. For the region to achieve improvement in environmental management and accelerated development for sustainable growth and development, there must be redoubled efforts to scale-up flood control and management, climate change mitigation and adaptation initiatives. Environmental Education is imperative and it is now a must. At every level of education; on radio, television, newspapers and magazines; and in every public forum, these must be stressed; and research and development efforts should not be relented either.

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APENDIXES

Appendix I: Flood in Lagos: Commuters lashing their ways through flood and on canoe



Appendix II: Flood in Akure: Oando Filling Station and surroundings submerged in flood



Appendix III: Commuter Vehicles submerged in flood and Motor boy looking helplessly in Lagos



Appendix IV: Stranded school girl wading through flood water in fear to her place of abode



Appendix V: Road/Street washed away and drowning residents in Abeokuta



Appendix IV: Sight of a flooded community after six days of flood at Challenge Ibadan

