

PATTERNS AND RISK FACTORS OF INLAND WATERWAYS BOAT ACCIDENTS IN NIGERIA

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Abstract

The study investigated the patterns and risk factors of boat accidents along Nigeria inland coastal waterways. Specifically, the study aimed at determining the patterns of boat accidents, the causes and level of safety awareness and emergency preparedness of boat operators and the extent of their adherence to safety conventions in Nigeria. Information on the patterns of boat accidents was obtained from the Nigeria Watch database complemented by data obtained from random sampling of 200 boat operators and users and the marine police selected from ten states known for high maritime transportation. The study revealed that a total of 180 incidence of boats accidents in which 1607 lives were lost between years 2006 and 2015 were recorded, with year 2013 recording the highest incidence while years 2010 and 2015 recorded the least accidents incidence. It was further revealed that the safety awareness and emergency preparedness of the boat operators is indeed very low. The study recommends the need for the government and operators of the marine sector to ensure effective training and enlightenment of the boat operators on the need to adhere to safety conventions.

Keywords: *Patterns, Risks factors, Boat accidents, Inland waterways and Marine transportation*

Introduction

The movement of goods and services along inland waterways in Nigeria has been one of the oldest means of transporting goods and services from one spatial unit to another. This is largely due to the fact that inland water transport offers the most economical, energy efficient and environmentally friendly means of transporting all types of cargo. Apart from the fact that many Nigerians make their living out of the inland waterways, recent studies (Nze, 2013 and Iheke, 2013) revealed that water transportation is the most cost effective means of moving goods and passengers from one place to the other. Corroborating this assertion with reference to a rider-ship survey of the Lagos State Waterways Authority, (LASWA), Akoni (2014) noted that

about a year ago over 1,800,000 people in the state travelled by water monthly, compared to the 1.5 million recorded as at June 2012. Aside these, the maintenance cost in rail and road transport is quite high compared to that of water transport. Added to these is the fact that heavy and bulky goods can be transported easily at little cost through water transport. During natural calamities like flooding and terrential downpour, when rail and road transport is disrupted, relief operations can be operated through water transport, while Large cities of the world that have canals and coastlines readily encourage use of the waterways to decongest their roads. This statistics portrays that water transportation occupies a strategic place in the economy of the nation especially

with the intricacies of road transportation, which is the justification for the Federal Government investments in commercial navigation in the inland waterways of Nigeria.

With inland navigable waterways of about 10,000km and an extensive coastland of about 852km, Nigeria has a great potential in the movement of goods from the coast to the hinter land by water transport. The country's waterways centre on the Rivers Niger and Benue which dissect Nigeria into East, West and Northern regions. The two rivers form a confluence at Lokoja and flow into the Atlantic Ocean. The coastal waterways extend from Badagry through Warri to Calabar (NIWA, 2006). In all, Nigeria has about 2,200km of route, out of the total drainage of the rivers from source to mouth. The system is connected to about 880km of inter-coastal water ways from Lagos through Warri, Port Harcourt and Calabar. With a total of approximately 3000km of underdeveloped but developable and navigable inland waterways, if fully harnessed, should be poised for a verile commercial river transportation and great potential for inter modernism in the country. Therefore the accruable benefits of the Nigerian inland waterways could be maximized from its vast potentials through proper exploitation and development.

In spite of its numerous advantages, there is a growing concern over the incessant boat accidents taking place in the inland waterways of Nigeria. Newspapers frequently report about boat accidents along different water channels, creeks and rivers within Nigeria's hinterlands and coasts. For example, Master Mariners Association of Nigeria (NMAN), (as cited in Oritse 2014) expressed concern over the incessant boat accidents in Lagos and called for more regulations on waterways transportation in the state. Statistics from National Inland Waterways Authority

(NIWA) show that 22 out of 36 states in Nigeria use water as a means of transport and over 296 Nigerians were lost as a result of boat mishaps in the year 2013 (NBS, 2014). Dogarawa (2012) pointed out that it is very absurd to read on a regular basis, reports about boat mishaps resulting in loss of lives and properties instead of breakthroughs made by Marine Engineers and Naval Architects in ship building, efficient wreck removals and ship recycling. Thus the spate of boat accidents on Nigerian inland waterways is fast becoming a nightmare and a source of concern for many people. In recent times, death through boat and ferry accidents on the nation's waterways have become rampant as lives were being lost too frequently in accidents that would have been averted. Newspaper statistics indicate that in March 2014 a commercial boat capsized on a canal on 4th Avenue, Festac Town, Lagos, resulting in the death of no fewer than 18 passengers. The same month, nearly 100 people perished when a passenger boat set off from neighbouring Benin Republic capsized off Cross River State. On April 2, 2014 in Majidun River in Ikorodu, Lagos, no fewer than eight people reportedly lost their lives while local divers rescued several others in a boat accident. Similarly, on December 26, 2013, a boat carrying about 50 passengers on the Buruku River in Buruku Local Government of Benue state capsized, killing some of its passengers. Elsewhere, a boat overloaded with passengers and goods travelling on the Niger River overturned, killing 42 people with hundreds others missing. The boat with an estimated 150 passengers on board broke into two after setting off from Malilli village in Niger state. Again, on February 4, 2014 at least 8 people drowned in Jigawa State when a canoe ferrying traders capsized and panicked passengers in another boat jumped into the river.

Considering the fact that whenever there is a boat mishap

properties and goods worth millions of naira will be lost in addition to precious lives which cannot be quantified, there is therefore a need for a study that would examine the patterns, causes of incessant boat mishaps and the level of emergency preparedness of boat operators to be carried out as it would provide empirical and policy driven data needed in evolving policies towards evaluating the cost associated with accident in terms of human and material losses as well as the assessment of the achievements of transport safety measures and the

relative benefit of alternative transport programmes and policies. Against this background, this study aims at investigating the pattern and risk factors of boat accidents along Nigeria inland waterways with the following objectives: i) to determine the spatial pattern of boat accidents in Nigeria and ii) to identify the causes and level of safety awareness and emergency preparedness of boat operators/users and iii) to find out the extent of their adherence to safety conventions in Nigeria.

Literature Review

The causes of boat mishaps are many and varied. The United States Coastguard (USCG), 2005 claimed that the number one cause of fatalities in boating accidents is capsizing which is caused by improper loading or overloading but it can also be caused by other things such as foul weather. Dogarawa (2012) expressed a similar view when he reported that maritime safety is compromised with cases of overloading, carrying people, animals, grains and petroleum products in one boat without fire extinguisher and no life-jackets. In a related incident, Naku (2007) reported by the death of 50 children in a wooden passenger and cargo boat which was overloaded with people and freight that developed mechanical fault on the Nun river of Bayelsa State. Another cause of boat mishaps in Nigeria's inland waterway is ignorance of boat operators of basic safety laws and regulations for the safe navigation of their watercraft. This ignorance was in turn attributed to illiteracy. Dogarawa (2012) attributed the incessant waterways accidents in Nigeria to the low educational levels of majority of the boat operators. He also reported that there is a general belief by boat drivers and users that they can rescue themselves any time there is trouble because they know how to swim. As a result, they tend to underrate the

importance of donning lifejackets while on board. While most boat drivers survive boat mishaps, others occasionally fall victim as a result of their erroneous belief. The above assertion is supported by Agbonoma (cited in Onabu, 2014) that the problem of failure to use life-jackets was common in waterways spread across 22 of the country's 36 states, but noted that the problem appeared worse in places like Warri and Onitsha where very few travelers used life-jacket than was the case in Lagos.

Dogarawa (2012) discovered that marine transportation is neglected in Northern Nigeria with dilapidated jetties, ill-equipped marine police, non-functional ferries and boats meant to be used by federal official and wrecks in the water channels without removal. He stated further that Marine activities suffer a great deal of setback in the hinterland due to serious neglect of water transportation despite its importance in the movements of people and cargoes especially farm produce. There are few dilapidated jetties which are submerged during the rainy season. Although there are offices of the National Inland Waterways Authority (NIWA) and the Marine Police in these places, their work is hindered by inadequate equipment. Investigations by Daily Sun (as cited in Marketwatch

2014) showed that about 90 per cent of the boat accidents occur at night when there is poor visibility, a development that is compounded by the absence of lights to indicate the location of wrecks on waterways. It was against the backdrop of the sector's infrastructural deficit on the navigable channels that the Federal Government, through the Nigerian Inland Waterways Authority (NIWA), recently banned night travels on the waterways. However, despite this ban, operators have regularly defied government policy and have relied on their over-rated knowledge of the water channels in daytime to move under the cover of darkness. Akomolafe (2014), recalled that the Interim Chairman of the Water Transporters' Forum during a town hall meeting on inland waterways safety, in his reaction to a question said that dirt, logs and wrecks could be hazardous to operations of boats on water. He explained that apart from having the capacity to cause a boat to capsize, wrecks constitute what bird strike could be to an aircraft in the air. Other causes of boat accidents as further discovered by Daily Sun investigation include rickety boats, overloading, over speeding, drunk riding, uncontrolled activity of loggers, wrecks on the waters, water hyacinth (weeds), non-adherence to safety rules and poor enforcement of recommended rules and practices on the part of government. The Nigerian Association of Master Mariners (NAMM, 2009) identified inappropriate reporting or taking over; inappropriate manoeuvrings; poor selection and maintenance of course, insufficient attention to weather or sea surface conditions; inappropriate anchoring or mooring and insufficient maintenance as other causes of marine accidents among others. In deed the causes of boat mishaps appear to be endless and it is obvious that something has to be done urgently in order to prevent their occurrence in Nigeria's Inland waters. This assertion is buttressed by the

statement of the Sun Reporter cited above who claimed that Nigeria's huge investment in the water transportation sector may go down the drain as rising incidence of boat mishaps on the nation's inland waterways is threatening its untapped potential with many seeing it as an unsafe means of transportation.

Akpobolokemi, (2014) opined that adequate sensitization of passengers and enforcement of safety standards would curb cases of boat mishaps in the country; that it has become important to educate boat operators and enlighten passengers on safety measures to be adopted at all times. Amodu (2014) identified the challenge of limited awareness about safety among passengers who cannot even recognize poorly organized boat services as causes of boat accidents in Nigeria inland waterways. Preventing boat mishaps in Nigeria's inland waterways requires concerted efforts by boat owners, boat operators and passengers, government agencies, especially the Nigerian Inland Waterways Authority (NIWA), Nigerian Maritime Administration and Safety Agency (NIMASA), Marine Police and the Maritime Academy of Nigeria (MAN) Oron. In fact any discussion on the prevention of boat accidents in Nigeria's inland waterways cannot be complete without reference to the statutory duties of NIMASA, NIWA and Maritime Academy of Nigeria, Oron, as they relate to the safety of inland waterways in Nigeria. NIMASA Act 2007 Part IV – Functions and Powers of the Agency, paragraph 22 states that "the functions and duties of the Agency shall be (among other things) to: (2f) generally to perform any other duty for ensuring maritime safety and security or do all matter thereto; The National Inland Waterways Act No. 13 or 1997, Laws of the Federation of Nigeria in Part II – Functions and Powers, paragraph 8b puts the responsibility of developing Nigeria's Inland waterways Transportation on the laps of NIWA. It

states that it shall be the functions of the authority, among other things to ensure the development of indigenous technical and managerial skill to meet the challenges of modern inland waterways transportation. To carry out the responsibility the least that NIWA can do is to organize safety awareness and sensitization programmes from time to time to educate boat builders, boat owners, operators and passengers on issues bordering on safety of boats, crew and passengers. It is also the statutory responsibility of NIWA in Part II of the Act to:

- i) par. 8(b), develop infrastructural facilities for national inland waterways;
- ii) par. 9(f), undertake installation and maintenance of lights, buoys and all navigational aids along water channels and banks;
- iii) par. 9(j) grant licence to private inland waterway operators;
- iv) par. 9(k) approve designs and construction of inland river crafts.

The Maritime Academy of Nigeria, Oron, also has a part to play in the prevention of boat mishaps in Nigeria's inland waterways. Cap M3 Laws of the Federation of Nigeria, 2010 establishing the Academy in Section 3 states that "the functions of the Academy shall be: (b) to train technical manpower for ports, marine engineering workshops, piloting and navigation, marine insurance, hydrography and other related services ... To this end Academy has already on

offer, inland waterways courses such as power Driven Small Craft operators course, Quarter Masters and River Masters courses and Able Seafarer course. In addition to classroom instruction of boat operators, the Maritime Academy also needs to be involved in organizing and taking safety awareness campaigns to the boat operators and passengers in their different local government areas and marine beaches respectively. Amodu (2014) identified the attitude of government, which according to him suggests a lack of political will to protect passengers patronizing these means of transportation as an indication that government has failed to live up to the expectation of citizens. To support his argument above, he quoted the President of Nigerian Master Mariner's Association as saying that as much as water transportation is considered to be one of the safety means of transportation, the need to imbibe a culture of safety cannot be overemphasized, adding that every measure must be put in place to ensure safety. He went on further to state that investigations revealed that these frequent occurrences of boat accidents in the country were as a result of non-enforcement of the laws that guide water transportation. Thus if the Federation Government Agencies such as NIMASA, NIWA, MAN, Oron, Marine Police and others charged with one duty or the other relating to inland waterway safety carry out their duties faithfully, the safety of Nigeria's inland waterway transportation will be greatly improved.

Materials and Methods

Data for the study was obtained from both secondary and primary sources. Information on the patterns and causes of inland waterways boat accidents in Nigeria were obtained from the Nigeria Watch database which sources information from 10 daily Nigerian press

corporations (Vanguard, Leadership, The Guardian, Sun, This Day, Daily Independence, Punch, Nigerian Tribune, The Nation and Daily Trust) as well as other human rights organizations, while data on the level of safety awareness and emergency preparedness of the boat

operators and the extent of their adherence to safety conventions were obtained through the use of structured questionnaire administered to 200 randomly selected boat operators and users and marine security personnel from ten states in Nigeria. Data on the patterns and causes of inland waterways boat accidents is restricted between June 2006 and May, 2015, due to the availability of data within these periods.

Purposive sampling technique was employed in the selection of 10 inland states from all the 31 states in Nigeria for the administration of the structured questionnaire designed to obtain information on the safety awareness and emergency preparedness level of the boat operators and the extent of their compliance with safety conventions. In each of the selected

states, the questionnaire was administered at berthing points of the boat operators as follows: Akwa Ibom – Oron 3) Cross River – Marina 4) Delta – Gbaturu 5) Niger- New Bussa 6) Lagos – Ikorodu 7) Kogi – Lokoja 8) Benue – Buruku 9) Edo – Agenebode and 10) Kwara – Lafiji. 20 questionnaire was administered proportionally to boat users and operators as well as officials of the marine police in each of the selected states, thereby bringing the total number of questionnaire administered to 200. Only 178 copies of the total questionnaire administered were duly filled, devoid of errors and returned. The data generated from the 178 returned questionnaires was analysed using descriptive statistics.

Results and Discussions

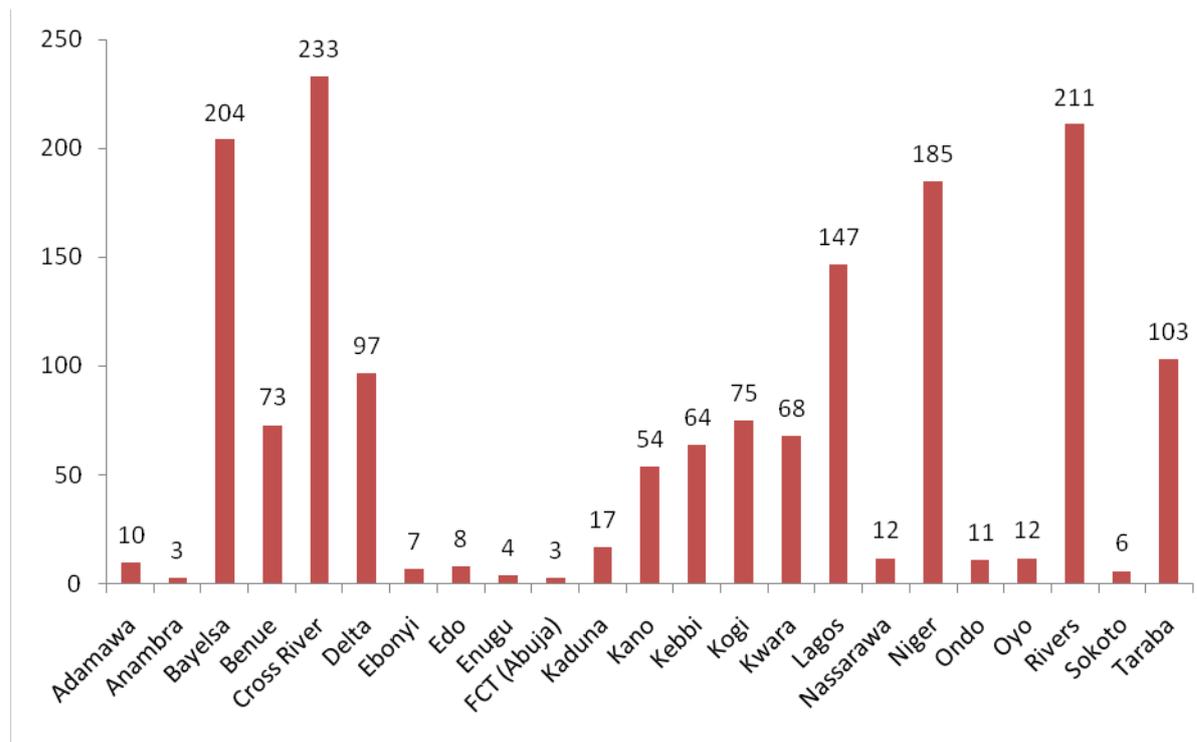


Figure 2.1: Spatial pattern of boat accidents fatalities in Nigeria (2006-2015)

Figure 2.1 reveals that the spate of fatalities of boat accidents in Nigeria varied spatial from states to states which could be attributed to the variation in the

expanse of coastlines, geographic location and the nature of socio-economic activities prevalent in the different spatial units under study.

Figure 1 showed further that five states (Cross River-233 deaths; Rivers - 211 deaths; Bayelsa -204 deaths; Niger -185 deaths; and Lagos -147 deaths) recorded the highest incidence of boat accident fatalities as this represent 60.1% of the overall boat accident fatalities in Nigeria within the period under review. Most of these states are situated within the

coastal region of Nigeria. These states rely predominantly on inland transport for most of its socio-economic activities while majority of the least fatal states (Anambra -3 deaths; Enugu -4 deaths; Sokoto -6 deaths; Ebonyi -7 deaths and Edo -8 deaths) are found within the inland states.

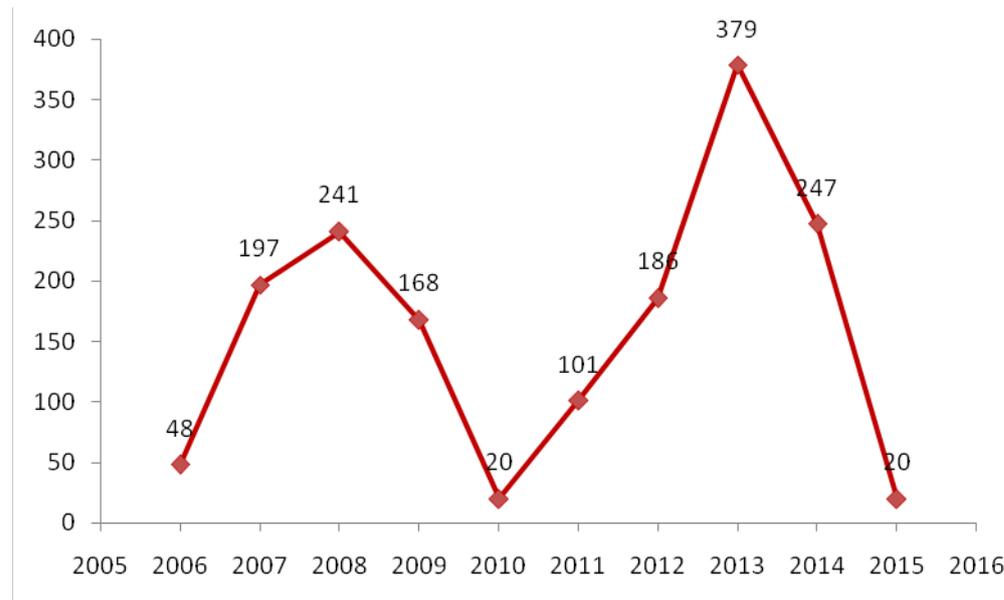


Figure 2.2: Temporal patterns of boat accidents

It is evident in Figure 2.2 that the risks associated with the fatalities of waterways accidents in Nigeria calls for a very serious concern. For instance, Figure 2.2 shows that in a total of 180 boats accidents incidence, 1607 lives were lost between years 2006 and 2015 with a steady increase in accident rates from 48 in 2006 to 241 in 2008 and a considerable drop to 168 in 2009 followed by a sharp decline in the fatality rate to 20 in 2010. The figure indicates a massive increase in boat accidents fatality rates in 2013 which confirms findings by the National Inland Waterways Authority (NIWA) and NBS (2014) report that over 296 Nigerians were lost as a result of boat mishaps in the year 2013. With reference to Figure 2, it is evident that the Niger Delta Region of Bayelsa, Cross Rivers and Rivers States accounted for most of the

inland waterways accidents at the period under review. A possible explanation for the increase in maritime accidents be the rise in the wave of youth restiveness occasioned by aggressive competition for environmental resources control and ethnic and identity crises in the Niger Delta region. The cesspool for self emancipation by the Niger Delta militants informed the establishment of the Amnesty Program by the Federal Government as a way of satisfying the aspirations and demands of the Niger Delta militants which unfortunately was later abused by the militants as some of them went back to the creeks as a result of perceived handling of the Amnesty Program to unleash their venom on security personnel (Police Gunboats), boat operators and passenger boats and oil barges. Statistics by Nigeria Watch show that between June 2006 and May

2015, 198 deaths were recorded in attacks and counter attacks that involved

militants and government security forces.

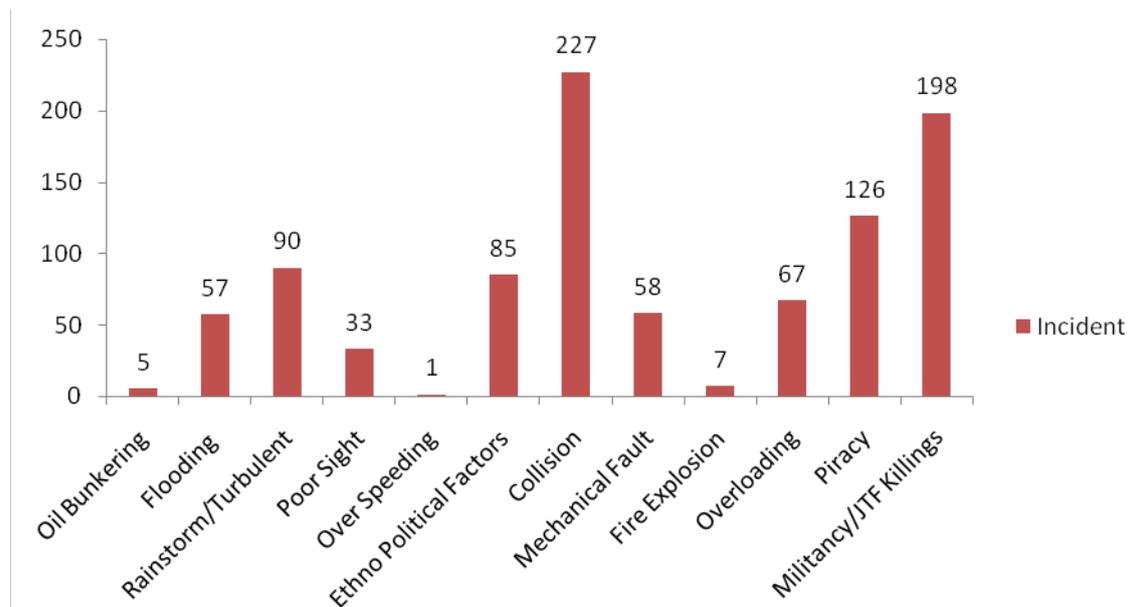


Figure 2.3: Causes of boat accidents in Nigeria inland waterways

The causes of boat accidents in the inland waterways of Nigeria as gleaned Figure 2.3 reveals that collision is the major caused of most of the boat accidents in Nigeria inland waterways as it accounts for 227 deaths in the periods under review. This is followed in ascending order by militancy and piracy, as both accounts for 198 and 126 of the total deaths respectively. Other major causes include rainstorms/turbulent weather (90 deaths), ethno-political issues (85 deaths), overloading (65 deaths), mechanical faults developed by boats (58 deaths) and flooding (57 deaths). Contrary to expectation over speeding, oil bunkering and fire/explosion accounted for the least caused of boat accidents fatalities within the period under study.

The level of safety awareness and emergency preparedness among boat users and operators is shown in Table 1. It is revealed that about 42.1percent of both the boat users and operators have moderate safety awareness level which is considered inadequate for safety of lives at sea in times of emergency or

mishaps. Table 1 shows further that only negligible (19.7 percent) proportion of the boat operators have high level of safety awareness with 38.2percent having a very low safety awareness levels. This confirms findings by Dogarawa (2012) that the level of safety awareness among boat operators in Nigeria is indeed very low which results from their low educational level while Naku (2007) opined that the ignorance of basic safety laws and regulations for safe navigation by boat operators is the major cause of boat accidents in Nigeria waterways. Table 1 further shows that majority (48.3percent) of the boat operators have low level of emergency preparedness with only 19.1 percent having considerable level of emergency preparedness. It is further gleaned in Table 1 that majority (55.7percent) of the boat operators have sea time experience of less than 10years. This is considered very inadequate, in view of the risk associated with inland waterways transportation. It is revealed that majority (44.4percent) of the boat operators do not receive any safety

training, compared to the 38.2percent who had in-service training. Again, while about 11.7percent had STCW '95' training, only 5.7 percent had Cross

Border Training (Table 2.1). This again unarguable contribute significantly to the high incidence of boat accidents recorded in Nigeria in recent time.

Table 2.1: Safety awareness and emergency preparedness level among boat operations personnel in Nigeria

Variables	Respondents	Percentage Response
I. Level of Safety Awareness		
High	35	19.7
Moderate	75	42.1
Low	68	38.2
TOTAL	178	100
II. Level of Emergency Preparedness		
High	34	19.1
Moderate	58	32.6
Low	86	48.3
TOTAL	178	100
III. Experience of boat Operators(Sea time)		
<5 yrs	58	32.7
6-10 yrs	41	23.0
10-15yrs	32	17.8
20-25yrs	28	15.7
Above 32yrs	19	10.8
TOTAL	178	100
IV. Safety Training Received by Boat Operators		
None	79	44.4
In-house training	68	38.2
STCW "95 training	21	11.7
Cross border Training	10	5.7
TOTAL	178	100

Source: Field works (2016)

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Table 1.6: Extent of Adherence to Safety Conventions

Variables Response	Respondents	Percentage
I. Adherence Level		
Most strictly adhered	16	9.0
Strictly adhered	42	23.6
Moderately adhered	79	44.4
Not adhered	41	23.0
TOTAL	178	100
II. Safety Convention Adhered to;		
International Convention on Safety of Life at Sea (SOLAS)	31	17.4
Standard for Training and Certification On watch keeping (STCW)	36	20.3
International Convention for Prevention Of Pollution from Ships (MARPOL)	44	24.7
International Convention on Load Line (LLC)	21	11.8
International Convention on Collision Regulation at Sea (COLREG)	18	10.1
International Safety Management (ISM) code	28	15.7
TOTAL	178	100

Source: Field work (2016)

Table 2.6 shows that majority (67percent) of the boat operators do not adhere strictly to safety conventions due to the general belief by majority of the boat drivers and users that they can rescue themselves anytime there is trouble because they know how to swim as observed by Dogarawa (2012), while 32.6 percents make conscious efforts to adhere to safety conventions. It is also revealed in Table 6 that the safety conventions adhere to by the boat operators are mostly International Convention for Prevention of Pollution from Ships (MARPOL) and Standard for

Training and Certification on Watch Keeping (STCW) as these respectively accounted for 24.7percent and 20.3percent of the total responses of the sampled respondents. While adherence to the International Convention on Collision Regulation at Sea (COLREG) was generally as low as 10.1percent, adherence to the International Convention on Load Line (LLC) was 11.8percent, with adherence to International Convention on Safety at Sea (SOLAS) and International Safety Management (ISM) code was 17.4percent and 15.7percent

respectively. These further confirm findings by Akpobolokemi (2014) that the level of sensitization and enforcement of safety standards in Nigeria is indeed very low in spite of its advantage of curbing cases of boat mishaps in the country. The very low adherence to the International Convention on Collision Regulation at Sea (COLREG) by boat operators could therefore be said to be responsible for the high rate of boat accidents as evidenced in Figure 3 where collision was identified as the major cause of most of the boat accidents in Nigeria inland waterways accounting for 227 deaths in between year 2006-2015. The Collision Regulations Rule 15 states that 'when two power-driven vessels are crossing as to involve risk of collision,

the vessel which has the other on her own starboard side shall keep out of the way and shall, if the circumstances of the case admit, avoid crossing ahead of the other vessel. The above rule of the road at sea forms the basis of crossing situation which constitutes a major human factor cause of boat accidents during voyages. It is revealed that proper training of boat operators on the proper application of these rules to reduce the occurrence of boat accident in the waterway. The negligence for safety rules by boat operators and the poor enforcement of recommended rules and practices on the part of the government are major factors identified as responsible for the high rate of boat accidents in Nigeria waterways.

Concluding Remarks/Recommendations

The study has shown that the low level of adherence to safety rules and poor emergency preparedness by boat operators as well as poor enforcement of recommended rules and practices on the part of the government are major factors identified as responsible for the high rate of boat accidents in Nigeria waterways. The study further revealed the causes of boat accidents in Nigeria's inland waterways to include ignorance of safety laws and regulations and illiteracy on the part of boat operators as well as the attitude of the passengers themselves. Therefore to prevent accidents in Nigeria's inland waterways, it is recommended that boat owners should ensure that their boats are not only designed, constructed and equipped according to the Inland Waterways Act of 1997 but should also assist the boat operators to acquire at least the relevant basic certificate(s) as provided by the Nigerian Merchant Shipping Act (MSA)

2007. Passengers should also be enlightened on basic safety awareness at sea through properly organised workshops by NIMASA, NIWA and relevant Maritime Institutions where inland waterways safety, rescue and survival techniques are taught. Boat operators should be encouraged and educated on the need to take relevant short courses in any of the Maritime or government approved institutions to upgrade their knowledge of basic safety principles at sea. Added to this is the need for NIWA, NIMASA and the Marine Police to intensify efforts to strictly enforce safety laws and regulations in the inland waterways, including imposing ban on night travels, donning of lifejackets and construction and licensing of boats. They should further ensure that boats are not overloaded at any time during trips.

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