ASSESSMENT OF SAFETY OF WATER CRAFT IN LAKE KAINJI, NIGERIA.

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Abstract

Assessment of Safety of Water Craft in Lake Kainji was conducted. A total of 50 questionnaires were administered to five randomly selected fishing areas along the lake. The items used in planning a lake trip shows that 30.23% and 28.68% used pole and paddles, while 19.38% and 16.25% used outboard engine and bamboo stick respectively. Majority of the respondents (32.92%) used Styrofoam as a life saving facility followed by bamboo (Kala, 24.37%), while empty tanks/jerry can accounted for 15.85%, life bouy contributed 13.41% of the life saving appliances. The major causes of accidents onboard include wave action/wind, free stump, overloading and stones in the lake. Others include wild aquatic animals and unskilled operators. 59.68% seek for help by shouting, while 32.26% by raising paddle up and whistle when seeking for help in boat in distress. Out of the respondents, 70.21% maintained boats by washing regularly, while 29.79 by washing occasionally. Finally, recommendations were made on how to improve efficient maneuverability for fishing and transport boats in Lake Kainji.

Keywords: *Safety, Watercraft, Lake Kainji*

Introduction

Navigation is the science of determining the position of a ship and craft or guided missile, and charting a course for guiding the craft safely and expeditiously from one point to another (Flore, 2000). However, the practice of Navigation requires not only thorough knowledge of science of navigation, but also considerable experience and judgment.

Safety, according to advanced learner's dictionary, "is the state of being safe and protected from danger or harm". Further more, according to Ministry of Defence (Navy, 1979) safety can be used to describe the normal precaution which are taken in a merchantship, to guard against fire, flooding, general danger, and casualties to personnel, whether caused by an accident or by the enemy, and to minimize their effect.

The Kainji Lake was free of water hyacinth (*E. crassipes*) until 1989, it came with the floods from the neigbouring Niger Republic (Olokor *et al*, 2002). The weed has since then multiplied and spread across the lake, causing serious obstruction to navigation and fishing activities. The International Regulations for Prevention of Collision at Sea, 1972 (COLREGS) and the navigation of inland waters rules enacted by law on 13th June, 1963 for Nigerian inland waters, together commonly known as the "Rules of the Road", comprise the laws all Mariners are required to obey to keep safe while traveling on the water.

In recent times various accidents have occurred in the lake leading to loss of life and property. In view of this, there is need to carry out studies on the safety of fishing and transport boats in Lake Kainji, North West, Nigeria.

The present study was to:- determine the basic crafts commonly used in the study area; evaluate navigational life saving practices in the study area; establish the boat maintenance practices in the Lake; and find out the constraints militating against effective navigation in the Lake.

Materials and Methods

Study Area

Lake Kainji lies in the savannah region between latitude 9° 30 and 10° 35'N and between longitudes 40°20' and 4° 40'E (Fig. 1) and was formed after the closure of River Niger in August 1968 (Balogun and Ibeun, 1995).The Lake has an area of 1270 km^2 being 25 km at its widest point and 137km at its longest point. It contains 13.97 km^3 of water at its maximum level. Although the primary purpose of constructing the lake was generation of hydroelectric power, the lake has offered great opportunities for a variety of development projects such as fisheries, irrigated agriculture and improved navigation on the River Niger (Balogun and Ibeun, 1995). The major occupation of the people around the lake is fishing with the total of 3,823 fishers, 4,416 canoes and 383 outboard engines as reported during 2004 frame survey (Abiodun and Niworu, 2004). Other occupations in the area include farming and livestock rearing.

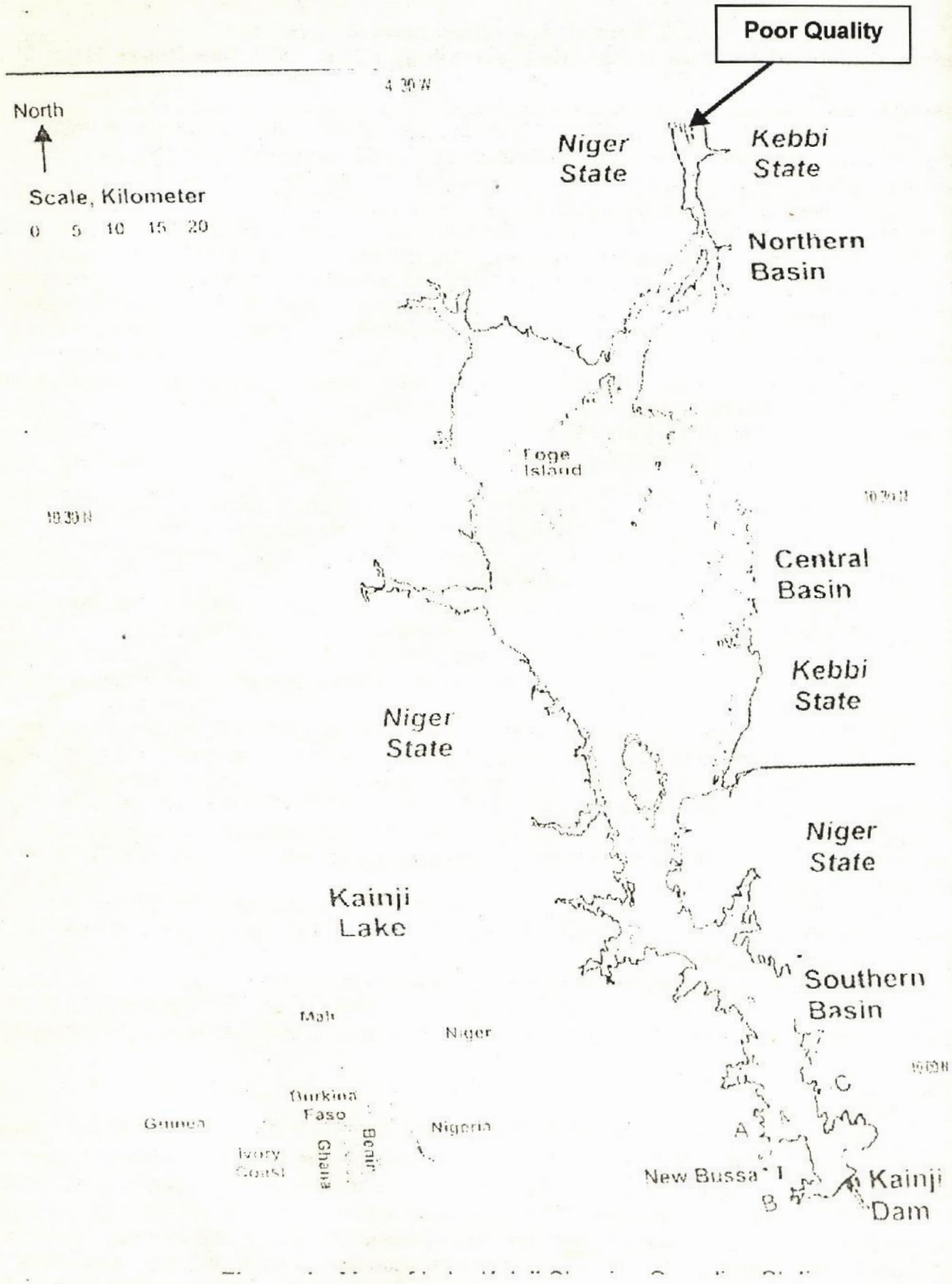

Fig. 1: Map of Lake kainji Showing Sampling Station

Five fishing villages viz: Yuna, Amfani, Malale, Wara, and Yelwa Yauri, of Niger and Kebbi States, were selected to ascertain the safety of fishing and transport system in the Lake. This includes the ways of finding direction in the lake, boat construction, and their maintenance. Five respondents were selected randomly in each fishing village for fishing and transport. This brings the sample size to 25 fishers and 25 transporters, giving a total of fifty (50) respondents in all. Information were collected on socio-demographic, life saving appliance, problems constraining fishing and transportation in the Lake. Subsequently personal data were also obtained from a staff of National Inland Water Ways Authourity (NIWA), Yelwa Yauri, Kebbi State, and from the department of Marine Police at Kainji dam complex and Yauri, on life saving appliances, and causes of accident on the Lake.

Data obtained in the 50 questionnaires administered were scored, and the percentages of the parameters were calculated appropriately and presented in frequency tables. Only simple descriptive statistics of means and percentages were employed in this analysis.

Results a nd Discussion

The results from Table 1 show the types of water craft used by the respondents. Majority (50%) used boat followed by canoe (46%) and least 4% of the respondent used Gourd. The length over all (LOA) (size) of the water craft shows that 54.17% used 4-7m LOA followed by 18.75% with LOA between 12-15m, while 16.67% used boats ranging from 16-20m LOA, and least (10.47%) were 8-11m LOA. The capacity in tons of the boat (Table 1) shows that majority (68.75%) had a boat capacity of 0.45-5 tons, followed by 25.1-30 tons (8.33%), while 6.25% each were 5.1-10, 10.1-15 and 30.1 and above tons respectively, and 2.08% each capacity were 15.1-20 and 20.1-25 tons. 87.50% of boats were constructed using primitive methods while 12.50% were by modern construction methods. According to Ministry of Defence Navy (1979), the hull of a ship must withstand the load imposed upon it by heavy seas or by the blocks in a dry dock, it must also be sufficiently strong to withstand damage in the event of collision or grounding.

About 44.32% and 36.36% of the boats were re-enforced with frames no-glued and not glued and not framed respectively while 15.91% not framed-glued and 3.41% glued and framed. 91.7% of the boats had improper shift of butt while 8.3% proper shift of butt. Ministry of Defence (Navy, 1979) reported that every ship carries a statement or drawing showing where the different materials are used in the ship's structure, as it is necessary to know the type of material when painting, chipping or welding, in order to avoid the wrong materials.

Table 1: Boats specification used by artisanal fishersmen in Lake Kainji

Parameters	Frequency	Percentage
Type		
Boat	25	50
Canoe	23	46
Gourd	2	4
Total	50	100
Size (m) LOA		
4-7	26	54.17
8-11	5	10.42
12-15	9	18.75
16-20	8	16.67
Total	48	100
Capacity (ton)		
0.45-5	33	68.75
5.1-10	3	6.25
10.1-15	3	6.25
15.1-20	1	2.08
20.1-25	1	2.08
25.1-30	4	8.33
30.1- and above	3	6.25
Total	48	100

Construction methods		
Modern	6	12.50
Primitive	42	87.50
Total	48	100
Re-enforcement with		
Not framed glued	14	15.91
Frames no glued	32	36.36
Glued and framed	3	3.41
Not glued and not framed	39	44.32
Total	88	100
Shift of butt		
Proper	4	8.3
Improper	4	91.7
Total	**44**	**100**

Items used in planning a trip, finding of direction and causes of accident are presented in Table 3. It was found that 30.23% and 28.68% used pole and paddles, while 19.38% and 16.25% used engine (In or outboard) and Bamboo (Kala) respectively, and the rest used styrofoam (3.88%) chart and cartube each 0.78%.

Majority (88%) of the respondents used celestial bodies to find their direction, while (12%) used flag. Gardner and Creelman (1986) stated that to an observer on the earth, the heaven present the aspect of a large inverted bowl with the earth situated at its center and the sun, moon, stars and planets situated around its surface, all equidistant from the earth. The major causes of accidents on board the boats on Lake Kainji are wave action/wind (35.71) and stump (25.89%), while 17.86% and 11.61% of accidents were caused by overloading and stones in the lake respectively wild aquatic animals (e.g. Crocodile) and unskilled operators caused 8.04% and 0.89%of accidents respectively.

Table 3: Important equipments used in boat maneuvering and causes of accidents on Lake Kainji.

Parameters	Frequency	Percentage
Items used in planning a trip		
Chart	1	0.78
Paddle	37	28.68
Pole	39	30.23
Engine (in or outboard)	25	19.38
Car tube	1	0.78
Bamboo stick	21	16.25
Styro foam	5	3.88
Total	129	100
Finding direction		
Celestial bodies	44	88
Flag	6	12
Total	50	100
Causes of accidents		
Stoves	13	11.61
Waves action/wind	40	35.71
Stump	29	25.89
HPT/Crocodile	9	8.045
Overloading	20	17.86
Unskilled operators	1	0.89
Total	**112**	**100**

Number not equal to 50 because of multiple responses.

Table 4 presents life saving appliances, seeking help in boat in distress, fire fighting equipment and knowledge of first-aid. Majority of the respondents (32.92%) used styrofoam as a life saving facility, followed by Bamboo (Kala) (24.39%), while empty tanks/jerry cans accounted for 15.85%, life buoy contributed 13.41% of the life saving appliances. Other life saving appliances include paddle, car tube, calabash and life jacket in decreasing order of magnitude. The International Convention for the safety of life at sea (SOLAS) stated that all seagoing vessel must be equipped with life saving appliances.

As shown in Table 4, 59.68% seek for help by shouting, while 32.26% by raising of paddle up, and whistle (8.01%). Bole *et al.* (1987) reported that the diversion resulting from the receipt of a distress message can occur at anytime and anywhere, provided it is reasonable, all ships within hundred miles or so, are likely to respond , even at some increased risk to themselves. A prompt response is an essential feature of most rescue missions. A distressed vessel can use whatever distress frequencies available (Bole *et al*, 1987).The types of fire fighting equipment (Table 4) show that 49.31% and 46.56% of respondents fight fire with sand and wet cloth, while 4.11% by fire extinguishers . It is essential to the safety of his ship that every seaman obtains working knowledge of the causes of accidental fires, and of how to prevent, control and extinguish them (MOD Navy, 1979). Majority of the respondents (76.19%) did not have any knowledge of first-aid treatment on board while 23.71% were aware of first aid.

Information on boat maintenance practiced by respondents in Lake Kainji are presented in Table 5. About 70.21% maintained their boats by washing regularly while 29.79% washed their boast occasionally. About 47.91% of the respondents did not paint their boats, while 20.83% each painted boats twice and once a year, espectively and least (10.41%) paint only once. Omorodion (1986) reported that the key is to prevent water from getting to the hull and construction materials not to have rust, rot or corrosion. The main requirement, according to the author, is paint, and painting on schedule, oiling, greasing and maintenance of moving or working parts.

The local materials used to improve boat life span are presented in Table 5. About 48% of respondents used shear butter followed by cotton wool (26.67%) while condensed engine oil accounted for 18.61%. Others used zinc/nail (4%) and Coal-tar (2%). Life span of boats treated with local materials included 63.82% between 10-19 years, 1-9 years (25.53%) while 20-29 years (8.51%) and 30-39 years (2.13%).

Table 4: Navigation life saving practices used in water Craft by respondents in Lake Kainji.

Parameters	Frequency	Percentage
Life saving appliances		
Bamboo (kala)	20	24.39
Paddle	7	8.53
Calabash	1	1.22
Styrofoam	27	32.92
Life buoy	11	13.41
Empty tank/Jerrycan	13	15.85
Cartube	2	2.43
Life jacket	1	1.22
Total	82	100
Seeking help in boat in distress:		
By shouting	37	59.68
Raising of paddles up	20	32.26
Whistle	5	8.06
Total	62	100
Fire fighting equipment (types)		
Sand	36	49.31
Fire extinguisher	3	4.11
Wetting	34	46.56
Wetting of cloth	73	100
Knowledge of First-Aid		
Yes	10	23.81
No	32	76.19
Total	**42**	**100**

Number not equal to 50 because of multiple responses.

Table 5: Boat maintenance practices by respondent in Lake Kainji.

Parameters	Frequency	Percentage
By washing		
Regularly	14	29.79
Occasionally	33	70.21
Total	47	100
Painting		
Yearly	10	20.83
Only once	5	10.41
No painting	23	47.91
6 months	10	20.83
Total	48	100
Local materials used to improved boat life span		
Coalter	2	2.67
Sheabutter	36	**48.00**
Condensed engine oil	14	18.61
Cotton wool	20	26.67
Zinc/Nail	3	4
Total	75	100
Year(s) spent when treated boat with local materials		
1-9	12	25.53
10-19	30	63.82
20-29	4	8.51
30-39	1	2.13
Total	47	100

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