Original

Bulletin of Environment, Pharmacology and Life Sciences

Online ISSN 2277 – 1808
Bull. Environ. Pharmacol. Life Sci.; Volume 1 [6] May 2012: 93 - 99

Website: www.bepls.com

A Short Review on: Fishing Boats used in Sudan Freshwater Fisheries

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ABSTRACT
Since fishing has been a traditional mode of existence in most coastal communities, each has come up with designs that are best suited to their styles of fishing and their understanding of the fishery and its behavior. For example, among natives of the Amazon river basin, the favored fishing vessel is light, wickerwork, single-person boat that makes spearing fish in the shallow waters fairly easy. On the other hand, backwater dwellers of Kerela in India and those around the upper parts of the White Nile in Sudd region prefer a dugout log to use as a canoe for practicing fishing activity. Sudan has various types of fishing boats used in fishing activities in the Nile system and a cross the Red sea, therefore, the present paper documents the regular V fishing boats widely used in the Sudan inland water concentrating on its local classification, materials used in building them and its history.
Key words: *Fishing gear, fishing boats, types of fishing boats, Nile fishing boats*

INTRODUCTION

The fisheries sector plays an important role in many developing countries, contributing towards food security, generation of employment and procurement of foreign exchange [11].

Fishing boats is a very general term used to refer to any water vehicle that can be employed to assist in catching fish. Usually, the term applies to commercial haulers that reel in, store and transport huge quantities of fish to be sold to consumers in fish market. These fishing boats are classified on their design and the kind of waters into which they are equipped to venture. The basic types are inland fishing boats and sea fishing boats. Regular fishing boats come in three styles: deep v, regular v or modified v. The 'v' refers to the angle and depth of the v shape on the bottom of the boat hull. This v is what determines how well the boat cuts through the water. Deep v's are suitable for deep, large lakes, as they are able to handle heavy waves with more stability. Regular v's are more suited to smaller and man-made lakes as the smaller body of water is generally not as deep and the waves won't be as turbulent. The modified v boat is quickly becoming the most popular, especially in the south, because of its ability to handle speed as well [2].

Fishing fleets in Sudan include various types of fishing boats according to diversity of geographical regions of a fishery. They are made from wooden and steel planks by both traditional and modern techniques and addition to imported boats made from fibreglass [3]. Therefore, this present review paper assists in providing baseline information on fishing boats used in Sudan freshwater fisheries due to an apparent lack of specialized documents related to this field in our national libraries.

CATEGORIES OF FISHING BOATS

Fishing boats are used in Sudan fall into three main categories according to boat design. 1) Hull form: fishing boats of hull plate have a round shape and operated in Red Sea in eastern Sudan and known as the displacement design. This design provides appreciated safe from strong waves and is suitable for fishing techniques that needs to haul fishing nets for long distances. 2) Flat Bottom: fishing boats of flat bottom plate are operated in the Nile River and its tributaries besides major inlets of the Nile system. This form of design helps fishermen to practice fishing activity and let them to row in areas that are shallow and covered with the Nile weeds. 3) Planning Hull: a planning hull design enables a fishing boat to operate easily into deepest water by fishermen for fishing purposes or even for transport needs. This form of design characterizes with combinations of multi-characters such as: safe, speed of displacement design and low resistance of flat design [3].

TYPES OF LOCAL FLAT BOTTOM FISHING BOATS

Generally, it can be considered that the most of fishing boats used in local fisheries fall into one category that is the flat bottom boats. There are three main types of them: Murkab Al-Hadeed (Plate. 1) and Murkab Al-Khashab (Plate. 2) boats and, Sharoaq (Plate. 3) canoes, beside a rare type called Faluka (Plate. 4) canoe [4]. They are used with different ratios as mentioned in some results of previous studies that have been done recently (Table 1). Both Murkab Al-Hadeed and Al-Khashab boats are wide spread in the northern parts of the White Nile fisheries; whilst, Sharoaq boats (they are called Bongolu in Roseires Dam; the Blue Nile) are commonest canoes used in the upper parts of the White Nile [5]. Faluka canoes are used widely in the Main Nile exactly in the northern state, but it was recorded only in Al-Kalakla fishery in the White Nile [6].

Source [6]

Plate 1. Depicts Murkab Al-Hadeed used in fishing activity in the White Nile

Source [7]

Plate 2. Depicts Murkab Al-Khashab used in fishing activity in the White Nile

Source [6]

Plate 3. Depicts Sharoaq canoe used in fishing activity in the White Nile

Source [6]

Plate 4. Depicts Faluka canoe used in fishing activity in the White Nile

Table 1. Fishing craft types (according to materials of make) used in Al-Kalakla (K) and Jabel Awlia Dam in the White Nile fisheries

Fishery	Percentage of fishing boat type %			
	Sharoaq	Murkab Al-Khashab	Murkab Al-Hadeed	Faluka
K	29.32	45.86	22.56	2.26
JAD (Downstream)	6.86	41.18	51.96	0.0
JAD(Reservoir)	48.15	29.63	22.22	0.0

Source: Mohammed and Ali (2008)

IMPORTED FISHING BOATS (MODERN BOATS)

Fibre-glass (Plate 5) is commonly known in the business as fiber reinforced plastic (FRP) or glass reinforced plastic (GRP), has been used in boat building for over 60 years "as discussed by [5]". Fiber reinforced plastics is used recently in building fishing boats in local fisheries. Therefore, FRP boats are still considered as imported materials for manufacturing fishing boats. These kinds of fishing boats are not preferable by local fishermen due to high cost of its purchase and repairing. This explains why FRP boats are rare in use in local fisheries [3].

Source [6]

Plate 5. Depicts Fibre-glass boat used in the White Nile

PROPULSION TOOLS

1. Traditional tools

Oars and sails are traditional tools used to move fishing boats into a fishery. Oars (called locally Migdaf) are made of pieces of wood or steel and operated by hand power. The positions of Migdafs are in middle sides of the boat's body. Sails are used when the wind is blowing to increase the speed of a fishing boat. It composes of mast (called locally Amood El-Sari), a piece of cloth (called locally Shiraa) and a rope (called locally Hable Al-Sari). It is put in the middle of the hull (called locally Farish) of a fishing boat [7; 6].

2. Modern tools

Modern tools mean providing a fishing boat with a motor (motorization). This device enables a fishing boat to navigate quickly and does not need to hand power to move. There are two types of fishing boats that are used motorization system. Outboard boats (Plate 6) use one engine with a particular power on the outside of a boat's aft (Daneiba). Inboard boats (Plate 5) are the second type that uses one engine in Farish [6].

Fishing activities in our fisheries are not for commercial purposes rather than for household needs. Therefore, the use of motorized fishing boat is not preferable by fishermen due to fuel cost; however, fishing by these kinds of boats covers a wider range of a fishery in a limited time [6]. Actually, motorization level of the fishing fleet is rather low in Jabel Awlia Reservoir (3.8%), and negligible in Sennar and Roseires [5]. In Lake Nubia, it has been recorded that fishermen are used outboard boats in fishing activities [8]. Generally, outboard is not used in fishing trips in both Jabel Awlia Dam and Al-Kalakla fishery; while, both propulsion tools (oars and sails) are dominant in use in local fisheries [4].

Source [6]

Plate 7. Depicts a fishing boat used an outboard engine in crossing the White Nile

TRADITIONAL NILE BOAT

1. History

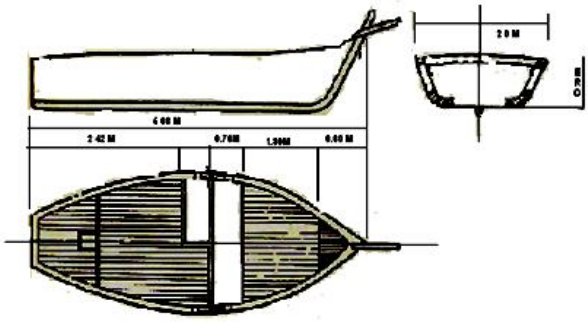
Murkab Al-Khashab (Plate 8) was created during the period of Al-Mahdia Revolution at the end of 18s century. It is a suitable design for use in the Nile River. Its forward (called locally Ras El-Murkab) and its aft (called locally Daneiba) is decked leaving an open space of approximately 1.5 m in mid-hull where the rowers sit. The boat is rowed by long woody oars in the middle boat hull for movement into river by hands power. Fastenings are of iron, hand-forged spikes for attaching the frames to keel and ordinary steel nails for joining the planks (called locally Looh) to boat frame [7; 6].

Source [6]

Plate 8. Depicts building operation of a traditional Nile boat

2. Building manner

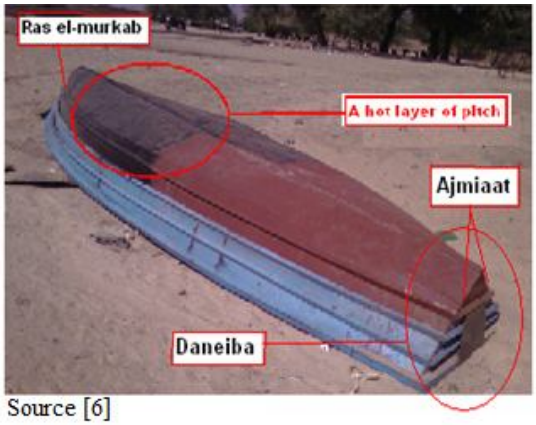
Traditional Nile boat (Murkab Al-khashab) is built with few and simple tools on the river shore (Plate 8). The keel (known locally Litrabel), stem (known locally Dugar) and transom (known locally Jakooce) are first set up in the building operation. The frames are hand-sewn from naturally curved timber and consist of bottom pieces and two side pieces nailed together. Bevel on the frames is roughly cut before erection and adjustments made during planking. The planking which requires a lot of twist in the bow is heated over an open fire and constantly wetted to avoid burning. Adjustment of planking is rough; leaving gaps that are filled with a large amount of sisal (known locally Girada). After final caulking (known locally Teskeen Al-Murkab) the hull is protected by a layer of hot pitch (this process is also performed to Murkab Al-hadeed) spread on the outside of the bottom boat (Farish) for further water-tightness (Figure 1 and Plate 9). Building process usually takes two to three weeks to finish if the building operation done by three builders [7; 6].



Source [9]

Fig. 1. Depicts a design of traditional Nile boat used in fishing activity

This type of a fishing boat, besides being reasonably cheap, is well-adapted for its original purpose; fishing and transport across the Nile River. The fishing gear is always worked from the aft deck; while, the space under the deck is used for storing of equipment, catch and, at cold nights, for sleeping. The boat carry a crew of four, five and in few cases 6 men. Any wind blowing makes it almost impossible to row these boats due to strong waves that bunt the bow and may be caused damages [9].



Source [6]

Plate 9. Depicts a hot layer of pitch painted on back of fishing boat's bottom for tightness

MATERIALS USED FOR BUILDING

Murkab boats are made of either wood or steel planks that let builders named them Murkab Al-Khashab and Murkab Al-Hadeed respectively. Wood is considered a cheapest and wide spread material that traditional builders use in manufacturing these boats usually on the river shore.

Because of the location of Sudan in tropical region of Africa; there are different kinds of trees (Table 2) used to make traditional fishing boats [7].

Table 1: Type of some trees used locally for manufacturing fishing boat.

Local name	Scientific name
Haraz or Haraza	*Acacia albida*
Sunot	*Acacia nilotica*
Neem	*Azadirachta indica*
Mahogani	*Khaya sp*
Sayial	*Acacia tortilis*

Steel planks are the second materials used in building fishing boats. Boats are made of steel (Plate 10) characterized by long life and fit to resist the rocky bed of the river such as a fishery of Jabel Awlia Dam in the White Nile River [4].

Source [6]

Plate 10. A side of fishing boatyard in Al-Shajara on the White Nile

TRANSPORT BOAT

Transport boats (Plate 11 & 12) are used to transfer both people and goods. Fishermen sometimes use transport boats for gathering catches that are caught in areas far away from central landing sites [6].

Source [6]

Plate 11. Depicts a transport boat used for corssing the White Nile

Source [6]

Plate 12. Depicts another version of transport boat used for corssing the White Nile

SELECTION CRITERIA OF LOCAL FISHING BOAT

Nature of a fishery is played a major role in selection fishing boat to use in. Therefore, Murkab boat is considered more suitable for use in northern parts of Jabel Awlia Dam in the White Nile; while, Sharoaq boats are quite suitable for use in weedy and shallow streams as in the upper parts of the White Nile. Generally, Murkab boats are more productive than Sharoaq boat, where one Murkab boat has catching power of 3 Sharoaqs [10].

Jabel Awlia dam, Sennar dam and Roseires dam are considered major three fisheries that fishing boats (Murkab and Sharoaq) are used intensively. Sharoaq boats are small and simple wooden planked-boat that can be operated by 1 or 2 fishermen using 1 to 2 fishing nets. Murkab boats are longer boats (4-6 m) than Sharoaq, made of locally available acacia wood, which can transport up to 15 fishermen (3 average) and 5 nets [5; 7].

Sharoaq boats (Plate 3) are considered having two good properties such as: having low resistance to the surface of water and having a narrow hull. Therefore, they are the best crafts for use in weedy and shallow waters as upper parts of the White Nile [6].

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