

Fishing Methods and their Implications for a Sustainable Environment

Olaniyan RF*

Department of Biology, Adeyemi College of Education, Ondo, Nigeria

Abstract

Commercial fishes found in Nigeria have been discovered over several thousand years ago. They are found in the Nigeria water ways such as, stream, lakes, rivers lagoon and even the sea. Notably among the fishes are the Cat fish (Scaly and non-scaly etc.). It has been established that protein from foods of animals origin is dangerously lacking in the diets of Nigerians and most Africans Idodo-Umeh (2003). The supply of meat from games and various domestic animals are not enough to meet the protein demand of the growing population in most African countries (Federal Department of Fisheries, 2003). The importance of fish protein in Nigeria cannot be over emphasized since more than 40% of the animal protein consumed by an average Nigeria comes from fish. Thus the total demand for fish in Nigeria is expected to increase since the population is increasing.

Keywords: Fishing Gears; Scine net; Gill net; Trap net

Introduction

Commercial fishes found in Nigeria have been discovered over several thousand years ago. They are found in the Nigeria water ways such as, stream, lakes, rivers lagoon and even the sea. Notably among the fishes are the Cat fish (Scaly and non-scaly etc.). It has been established that protein from foods of animals origin is dangerously lacking in the diets of Nigerians and most Africans [1]. The supply of meat from games and various domestic animals are not enough to meet the protein demand of the growing population in most African countries [2]. The importance of fish protein in Nigeria cannot be over emphasized since more than 40% of the animal protein consumed by an average Nigeria comes from fish. Thus the total demand for fish in Nigeria is expected to increase since the population is increasing.

This is because the rapid increase in world population has resulted in a huge increase in demand for animal protein and other nutritional requirements.

Human population is increasing at the rate of about 7.5 million per year and the major population increase occurs in the under-developed world, an area that holds about 75% of the world population [2]. With the present rate of increase in the world population is likely to double by the year 2020. In Nigeria, the current demand for fish food is estimated at a little over 1,000,000 tons per annum as against a supply of about 800,000 tons per annum [3].

To compensate for this deficit, Idodo-Umeh [1] suggested massive importation of fish into Nigeria stating that in 1975, about 119,000 metric tons of frozen fish were imported and this was increased in 1980 to about 330,000 metric tons.

This review therefore, aims at highlighting the various techniques employed in catching fishes and the implication of these techniques for sustainable fishing environment.

Literature Review

The shortage of animal protein is well recognized in our daily diet and little has been done to alleviate the problem, we still depend solely on natural source of fish supply.

The increase in fish protein cannot be achieved despite the improved exploitation of natural waters. Furthermore, importation in any form is a drain on the country's foreign reserves and to make good the aim of green revolution viz-a-vis self-sufficiency in food, fish production must be increased through the aquaculture practices.

According to Ayoola and Kuton [4], fish farming started in Nigeria around 1944 and it was geared towards increasing protein supply in local villages.

From the year 1970 upwards, there has been a drop in total world fish catches due to over-fishing. In Nigeria for examples, evidence of over-fishing has been shown in Lake Kainji where it was observed that the lake has attained natural equilibrium with a catch ranging between 4,000 – 6,000 metric tons of fish per annum [5].

The advent of the oil industry in the Nigeria economy has resulted in frequent incidents of oil blow-outs, burst pipes and spillages of crude oil, all of which endangered fish resources and fishing gear thus affecting fish catch.

The numerous gas flares have also disrupted the natural diurnal rhythm of the fish and affected adversely their breeding pattern and sites. All these resulted in low catches.

Fishing Techniques

There is lots of fishing water bodies in Nigeria. Examples include Argungu fishing water in Sokoto, Ayetoro/Igbokoda Ilaje- Ese Odo and Epe fishing waters. Fishing is also carried out in fresh water bodies like the rivers, streams, lakes and ponds.

In all these water bodies, the methods employed for catching fishes are broadly divided into two:

1. The crude methods/techniques
2. The modern techniques

Crude Techniques

These methods are also referred to as the traditional or primitive methods. They are methods used in catching fishes in the ancient traditional olden days. The techniques involved:

Fishing with screens

Screens can be made of bamboo or palm fronds and are often

*Corresponding author: Olaniyan RF, Department of Biology, Adeyemi College of Education, Ondo, Nigeria, Tel: 08059451660; E-mail: olaniyan4real_06@yahoo.com

Received May 14, 2015; Accepted July 24, 2015; Published July 28, 2015

Citation: Olaniyan RF (2015) Fishing Methods and their Implications for a Sustainable Environment. Fish Aquac J 6: 139. doi:10.4172/2150-3508.1000139

Copyright: © 2015 Olaniyan R. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

used in shallow tidal creeks and estuaries to form enclosures which are arranged in such a way as to allow the entry of fish or crayfish and disallow their escape. Fish are trapped in when the water goes down and are fished out at low tide using gears like scoop or trap nets.

Fishing with gears

This involves the collection of aquatic organisms that are sessile or not very mobile using wounding gears. These wounding gears include spears, cutlasses, knives, hooks and lines, primitive nets.

Modern Techniques

These are methods used in this present day world. They include the use of elaborate nets like the gill nets, bay nets, cast nets, drift nets, surrounding nets. Sophisticated equipment are also being used. These include motor propelled equipment which are now used for commercial fishing Diesel marine engine, trawlers and ships are purposely built and used for fishing voyages for 2-3 days and for preserving catches.

Types of Fishing Nets

Seine net

This is a kind of net in which one end of the net is fixed to an anchorage while the free end is moved along to surround certain area. The net is then pulled to close the fish within the area.

Gill net

This is a fabricated net. It is a type of fishing gear (net) used in catching fishes in the river. It is like a surrounding net but that of surrounding net is very large and it has a bag net and towing lines. Gill net is a rectangular piece of netting fixed with a head line on top and usually a foot-rope at the bottom. The headline is lifted with floats while the foot-pole is weighed with lead, stones and the combination of floats and weights makes it possible for the net to stay upright in water.

Trap net

This is a type of net used mainly for catching shrimps, small fishes and crabs. The fishes are usually caught in wicker baskets containing baits. These baskets are usually lowered into shallow coastal water and left for one or two days before they are hauled up. Salmon which are returning to breed in rivers are sometimes caught by traps placed in the mouth of rivers.

A trap net consists of a line of wooden stakes driven into the sea bed at the end of which is the trap. A platform is usually built over the trap to enable fishermen to haul the catch.

Bag net

These consist of bags of netting materials usually synthetic with the mouth of the bag kept open through total or partial tanning. Nets of this kind vary from the small hard or scoop net used in removing fishes from drained ponds and drying up flood plains to the advanced mechanically propelled trawl nets used in industrial fisheries.

Cast net

This type of fishing net is conical in shape and mainly used on fishes that are easily baited e.g. Tilapia and surface swimming fishes. In using this net, cassava roots are put in several locations in water and these locations are pegged to the bottom water with sticks. The net is then cast in the locations where the bait (cassava roots) are put.

Drift net

This is another type of gill net. It normally hangs vertically in the water and weighted along the bottom edge and supported along the top edge by floats. Drift net are usually set without anchors and they

drift with the water currents. Fishes are caught by their gill becoming entangled in the mesh of the nets.

Hook and lines

There is a decline in the use of this method, but fishermen who use this method only engage in it mostly to catch fish for domestic consumption. The fishermen numbering about 3-4 are in a relatively small boat which have attached hooks at intervals of short distances to a line. Baits like earthworms, rotten fish are attached firmly to the hooks for the attraction of the fish. Any fish trying to swallow the baits attached to the hooks gets itself hooked up.

Surrounding net

This is fabricated like a set net (gill net) but is very large and has bag net and towing lines. When a good fishing ground is located, the net is set to surround such a spot in form of a closed ring. This net is operated by 20-30 fishermen. The float line is pulled by some group of fishermen and the headline is pulled by another group of fishermen while they go into their closure to pulse at the bottom of the net.

After pulsing, any fish within the surrounded enclosure will be caught through the bag net. It takes about 3-4 canoes to operate the surrounding net.

Trawlers

A trawler is a large wide mouthed net which is dragged along the bottom of the sea. Trawlers are very expensive thus they are not commonly owned by individual or small companies. They are mostly purchased by State or Federal Fisheries Boards e.g. Lagos State Fisheries Board. The largest conventional trawlers owned by Lagos State Fisheries Board do not exceed 100 ft in length. On these trawlers are large fish holds for keeping the fishes. These vessels can travel several miles away from their home base holding big fishes like tilapia, cat fish, etc.

The Sea Fishing

Sea fishing is of three types:

Up-country fishing in rivers and lakes

Nigerian rivers and lakes abound in a large variety of fishes which have different local names. They are caught either with fishing nets or lines. The catch is sold locally since the coastal supply does not always arrive fresh in land; the local catch from the main source of fresh fish supplies the interior.

Fishing creeks

The important fishing industries depend on creeks. The Igbokoda and Epe fishermen are well known in this industry. They use trap, nets and mixture of mashed leaves which when put in the water appear to intoxicate the fish which becomes easy prey for the fishermen. The catch is either eaten locally or smoked in special fish ovens for commercial purposes.

Lagoon and offshore fishing

since fishing in the lagoon is carried out by the same people, fishing in the lagoon and Open Ocean go hand in hand. The fishermen stay in the lagoon during the day and go to the sea after the super. They return the following morning with their vessel loaded with the catch. The mid-morning visitors can buy fish directly and more cheaply from the fishermen than they can in the town. Vessels equipped with refrigerators are used in this type of fishing.

Implication of Fishing Techniques

Effects of crude techniques

As earlier discussed crude method was the main fishing technique

used by traditional or local fishermen in catching their fishes from the water.

However, both the technique and the fishing gears employed pose some hazards to the fishes, the aquatic environment and the society at large.

The use of poisons or chemicals like gamalin 20, Didimore 25 and poisonous leave, roots and fruits of some toxic plants cause water pollution thereby making the water unsafe for human use.

Consumption of fishes killed by poison also has lethal effects on the consumers. By eating poisoned fish, the poison or toxic is directly or indirectly transferred to the consumer which if adequate medical care is not taken, vital organs may be damaged and may eventually result in death. A pregnant woman that takes poisoned fish faces the likelihood of the unborn suffering from some congenital abnormalities.

So also poisoned water is very unsafe for drinking or for other domestic uses. The use of poisoned river for irrigation to agricultural farmlands also poses a potent environmental danger to the agricultural crops and the farmland. The use of hooks, spears, cutlasses inflicts physical damage on the fishes and this accelerates the rate of decay of the fishes as a result of bacterial invasion on the damage parts.

The volume of catch is also reduced by the use of hook and line method. It is also time-consuming as fishermen have to spend a long time on boat only to catch few fishes.

The use of local fish nets whose mesh sizes are not regulated or nets with undersized meshes poses dangers for small young fishes especially the fingerlings, which may likely be scooped out of water prematurely.

Effects of modern techniques

This method involves the use sophisticated modern equipment as fishing gears. It includes the use of fishing nets with regulated mesh sizes, motor propelled machines, diesel marine engines, trawlers and ships for commercial fishing.

With the use of these modern fishing equipment

- i. More catch is registered at faster rate.
- ii. The fishes caught are safe for human consumption.
- iii. The purity or quality of water is not affected since the water is not polluted. Thus the water is safe for drinking and for other domestic uses.
- iv. Fishes can be stored for longer period and well preserved in mobile refrigerator fishing vessels.

Conclusion

It is believed that the crude technique of fishing which was widely practiced in our communities had not only brought a serious decline into commercial fisheries, but has also introduced hazards of various magnitude to the consumers and the entire aquatic environment. Crude fishing method also made fishing a time consuming ventures with little or no harvest to show for the time wasted, but with the introduction of modern fishing technique has not only boasted fish supply, but has brought appreciable positive effects on proteins consumption, also preventing lot of health hazards associated with the consumption of poisoned fishes using a modern method is a good and reliable avenue for improving the nation's economy a good source of job creation. However, Crude method should be prohibited from using among the fish folks or commercial fish farmers for realization of sustainable environment.

Recommendations

- i. Reducing tariffs on imported modern fishing equipment.
- ii. Providing adequate trained man-power to train the local fishermen in the use of modern fishing equipment.
- iii. Providing soft loans for local and commercial fish farmers to procure these equipment at affordable prices.
- iv. Organizing workshops and seminars for fish farmers in order to up-date their knowledge on modern fisheries. These workshops and seminars also help to acquaint the local fish farmers with the benefits accruable from the use of modern fishing techniques and the hazards associated with the continued use of crude methods.

References

1. Idodo-Umeh G (2003) Freshwater Fishes of Nigeria (Taxonomy, Ecological Notes, Diets and Utilization). Idodo-Umeh Publ Ltd Benin City, Nigeria.
2. Federal Department of Fisheries (2003) Presentation on the Fisheries sub – sector at the Presidential Forum Lagos. Fisheries Society of Nigeria 34-56.
3. Soyinka OO, Kassem AO (2008) Seasonal variation in the distribution: Fish Species Diversity of a tropical Lagoon in South-West Nigeria. Journal of Fisheries and Aquatic Science 3: 375-383.
4. Ayoola SO, Kuton MP (2009) Seasonal Variations in Fish abundance and physicochemical parameters of Lagos Lagoon Nigeria. African Journal of Environmental Science and Technology 3: 149-156.
5. Ita EO (1993) In-land Fishery Resources of Nigeria. CIFA Occasional Paper No 20, FAO.

Citation: Olaniyan RF (2015) Fishing Methods and their Implications for a Sustainable Environment. Fish Aquac J 6: 139. doi:10.4172/2150-3508.1000139

Submit your next manuscript and get advantages of OMICS Group submissions

Unique features:

- User friendly/feasible website-translation of your paper to 50 world's leading languages
- Audio Version of published paper
- Digital articles to share and explore

Special features:

- 400 Open Access Journals
- 30,000 editorial team
- 21 days rapid review process
- Quality and quick editorial, review and publication processing
- Indexing at PubMed (partial), Scopus, EBSCO, Index Copernicus and Google Scholar etc
- Sharing Option: Social Networking Enabled
- Authors, Reviewers and Editors rewarded with online Scientific Credits
- Better discount for your subsequent articles

Submit your manuscript at: <http://www.omicsonline.org/submission>