

## REPACKAGING MARINE AND AQUATIC INFORMATION FOR FISHERMEN IN GHANA: THE WAY FORWARD

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**ABSTRACT:** The study is an attempt to provide a model or prototype for basic information on fishing such as required by fishermen in Ghana. It is based on questions raised by the fishermen themselves. Numerous researches have been carried out on marine and aquatic resources but the findings remain abstract to fishermen, the majority of whom are illiterate. The information needs of the fishermen is repackaged in easily comprehensible form. Types of fishing implements, techniques of fish preservation, marketing methods, fish farming and further sources of information are given. The next step is to translate this information into the local languages.

**KEYWORDS:** Information, Fishermen, Fish preservation,

### INTRODUCTION

Fishing is a very important activity in Ghana and constitutes a good source of income and employment for fishermen and those engaged in fishing related enterprises. Fish is relatively affordable, contains protein and as such is found in many local dishes. Government and individual efforts have continued to be made to improve methods by which more fish could be made available for consumption. The main group of players in these efforts are scientists who, among others, have been researching ways of increasing fish production in ponds, lakes, rivers, lagoons and the seas. To this end research scientists have been in constant touch with members of the Association of Farmers and Fishermen in Ghana in order to disseminate to them results of their research. This they do through workshops, seminars and other training sessions.

The following sections are designed to explain some of the basic facts that fishermen want to know about their sector. It is based on a survey that was conducted among

fishermen in some fishing communities in Ghana A total of 200 fishermen were interviewed and focus group discussions were used to elude a general consensus.

### **Frequently asked questions by fishermen**

Fishermen wanted to know some basic things about the fishing sector. These are not new questions but they desired to know the general situation that has been supported by research. The main issues are:

1. When is the fishing season?
2. What type of implements am I required to use?
3. How do I preserve, store and market my catch?
4. What are the basic requirements for fish farming?
5. How do I handle technical problems that I am confronted with?
6. What are the fishing statistics in Ghana?
7. Are there any information sources available?

### **Fishing seasons in Ghana**

There are two major marine fishing seasons in Ghana. These are the:

1. Major upwelling (Bumper) season
2. Minor upwelling (Lean) season

#### **1. Major upwelling (Bumper) season**

The major upwelling or bumper season lasts approximately three months in the year. It begins towards the end of June or early July and ends in late September or early October. The major upwelling season begins when the sea surface temperatures fall below 25<sup>0</sup>C - 17.5<sup>0</sup>C.

#### **2. Minor upwelling (Lean) season**

The minor upwelling or lean season occurs for approximately three weeks in January or February or rarely in December or March. During the minor upwelling season, sea surface temperatures fluctuate between 27.5<sup>0</sup>C -26<sup>0</sup>C.

#### **3. Taboos**

Related to the fishing industry, practices and periods are taboos. These are prohibitions or restrictions imposed by social customs. Today, many of these taboos have come to be understood as conservation practices which over the years have been observed to ensure the sustainability of the industry. It is important for fishermen to know rules and regulations which govern fishing practices and abide by these unique rules. In Africa, taboos and cultural practices in fishing especially lagoon fishing are well known.

In Ghana, fishing in the sea is not permitted on Tuesdays. Fishing is also banned in some lagoons, prior to certain festivals. Some fishing gear is also not allowed in some lagoons. Every lagoon is believed to have a god or goddess which protects it. The custodian is usually a fetish priest or priestess who performs traditional rites and is responsible for enforcing the laws and regulations governing the use of the lagoon.

Traditional management practices are a way of ensuring that fish in the lagoon grow to maturity and breed without being disturbed. They are also meant to regulate the harvesting of fish, preservation of water quality and the conservation of wetlands. Fishing for instance, is banned on Wednesdays in the Duen lagoon because it is a sacred day of the god named Nana Tano. Duen lagoon is a large lagoon found at the border between Ghana and La Cote d'Ivoire (Ivory Coast). It is fed by the River Tano. Manatees found in this lagoon are regarded as sacred animals and rituals are performed whenever one is killed. Women are not allowed to witness the killing of a manatee. Drag nets are also not allowed in the Duen lagoon.

Most often, these taboos are not documented, but every native in the community is expected to know about their existence and send a word of caution to new settlers. Mishaps such as loss of lives are often attributed to the breaking of taboos.

#### 4. Coastal Stations

Related to the question about fishing seasons is the fact about the weather. Fishermen have traditionally relied on the movement of clouds, winds and ocean currents to determine the weather conditions. This has not always brought about the desired results. Fishermen are advised to check on information concerning weather conditions so as to save lives by listening to the numerous radio stations and watching the weather reports which are presented every day after the news telecast on local TV stations. Alternatively they are advised to contact the following coastal stations for more information on weather conditions:

- i. Tema
- ii. Keta
- iii. Winneba
- iv. Elmina
- v. Takoradi
- vi. Axim
- vii. Half Assini
- viii. Cape Three Points

## **Types of Implements to Use**

The fishing industry, like any other profession requires the use of special implements and tools. Among the basic implements used are:

1. Cast Nets,
2. Drag Nets,
3. Hooks and Lines, and
4. Spears.

### **1. Cast Nets**

Cast nets are the most popular gear used in the lagoons. They are made of either twine or nylon. A cast net is flung or cast from a canoe onto the water to trap the fishes. An alternative is to wade through the water especially when it is shallow and cast the net. Some fishermen catch fishes trapped in the nets with their bare hands. The most common fishing craft is the canoe.

### **2. Drag Nets**

Drag nets are mainly made of twine, with bags into which the fish swim and get trapped. Some drag nets have bags which are reinforced with sticks to keep them upright so that they can be dragged onshore easily. Drag nets are most effective during low tide.

### **3. Hook and Line**

Hooks and lines are used mostly in estuaries and bigger lagoons. Hooks are attached with baits such as small fishes or worms on long lines. The hook with the bait is flung into the water to attract and catch the fish. The line is held on tightly since the fish may pull and thus cause drowning. Fishing by this method could be time-consuming.

### **4. Spears**

Some fishermen in the Volta estuary and the Amansuri lagoon use spears to hunt manatees and bigger fishes.

## **Fish Preservation Techniques**

Several methods could be used to preserve fish. These include smoking, freezing, salting, drying and fermenting. In Ghana fish is preserved mainly for the following reasons:

1. to prolong its shelf life,
2. to improve taste, i.e. to enhance flavour and increase utilisation in soups and sauces,
3. to increase income, i.e. to reduce waste in times of bumper catches and to store against the lean season,
4. better nutrition, i.e. to increase protein availability to all people throughout the year, and
5. improved marketing, i.e. to make it easier to pack, transport and market.

The commonest methods of preserving fish among many fishing communities is either by cold storage or by smoking. Smoking however is most popular and is accomplished by various techniques. Below is a brief outline of existing fish smoking technologies.

### **Improved Fish Smoking Ovens**

#### **Ivory Coast kiln**

This is the most acceptable of modern ovens because it combines efficiency and simplicity. However it deviates considerably from traditional designs and the materials are expensive.

#### **Various types of metal ovens**

These are expensive and difficult to maintain because they are made of metal.

#### **Steel drum smokers**

These are also cumbersome to operate and have very limited capacity.

#### **Chorkor Smokers**

This has proven to be readily acceptable by women who practice traditional fish smoking methods. A well constructed one, usually made of cement, can last about 15 years. It is the type mostly recommended for the following reasons:

- it has a long life span,
- low construction cost,
- large capacity,
- high quality and uniformity,
- easy to operate,
- low consumption of fuelwood, and
- much less time in effort for operation.

#### **Ovens**

The ovens are rectangular, about twice as long as wide with two stoke holes in front.

#### **Preparation of fish for smoking**

Except for larger fishes such as grouper, tuna, and snapper, the gills guts and scales are normally not removed before smoking. The larger fishes are normally cut into steaks or fillets but medium and small fish are smoked whole. The fishes are washed in clean fresh or salt water and carefully arranged on trays. Sometimes they are left for about an hour to

dry in the sun before smoking. The trays are filled with fish and then stacked on top of each other in the chamber of the oven.

### **Fish smoking process**

The smoking process can take between one hour to two days depending on factors such as the type of fish (species, thickness, the way it is cut), the purpose for its use and the length of time it would be stored. The fish are turned and the orientations of the trays changed two to four times during smoking cycle. The upper trays are placed closer to the fire while the lower ones are moved higher. Sometimes the trays are turned 180° on the oven.

### **Fish Storage**

Fish can either be stored by freezing in or storing cold. Properly smoke-dried fish which is not salted can be stored for up to nine months in the tropics if the following rules are observed:

- a. Use of storage containers that can be properly sealed against the introduction of moist air and insects,
- b. Tightly covering the containers (outside for stacks of trays and inside for baskets) with plastic sheets, brown paper or banana leaves (in order of preference),
- c. Handling the fish as little as possible,
- d. Packing the smoked fish away carefully as soon as it cools, and
- e. Periodic re-smoking (at least bi-monthly) to drive out moulds, fungi, bacteria and insect larvae.

Packing of fish for the market. Smoked fish is packed tightly in baskets, then covered to the rim of the basket. If the baskets are small (40 x 50cm), they are often sewn together, rim to rim. Sometimes, grain sacks or wooden boxes are used to transport the smoked fish over short distances. Other types of fish containers include crates, baskets, cartons, head pans, transparent glass boxes and sacks.

### **Marketing of fish**

Fish can be marketed fresh, fermented, salted or smoked. The fishmongers who are mainly women, however, prefer to sell smoked fish in large quantities. They will store the fish as much as possible whenever prices are ridiculously low for a considerable number of weeks. They will then hire trucks individually or collectively to transport the fish to whichever market would fetch the best price. Alternatively they would sell it to wholesalers.

For smaller quantities, they would either prepare a head load of the smoked fish and walk to market or transport them in baskets or bundles by means of public transport to nearby markets. At the market, they may choose to dispose of the fish through wholesale agents.

More than half the fish produced at the coast is transported to distant markets in the interior of the country or to neighbouring countries, where smoked fish is in greater demand. The market value of the fish is assured by the way they are handled during the smoking, packing and transportation process. Burnt, bent and broken fish is less attractive for the market. In many cases headless fishes are not chosen by clients.

### **Record Keeping**

It is important that fishermen and fishmongers or traders keep records of all their business transactions. This will enable them know how much money they invest in all activities involved in their trade. During the peak season, there is very little demand for smoked fish in the production centres. Prices are therefore slightly higher than those for fresh fish. During the lean season (particularly in the interior of the country) the price for smoked fish could be higher, sometimes about five times the value of fresh fish.

### **BASIC REQUIREMENTS FOR FISH FARMING**

Scientists have developed ways of increasing fish production in fish ponds to supplement fish that is obtained from the seas, rivers, lakes and lagoons. For a profitable fish farm enterprise, some basic requirements need to be met. These requirements include the following:

1. selecting a site for the farming based upon suitable geographical conditions,
2. adopting the fish farming environment,
3. considering the type of fish or fishes to be raised, and
4. human and material resources available for the farm operation.

What matters most to a fish farmer, especially the commercial one, is the type of fish he or she can raise to earn enough money. In Ghana, and as in most tropical and semi-tropical areas, the fish species that have been found to be suitable for beginners are tilapias and catfish. Other freshwater fish species suitable for culture in Ghana are shown in Table 1 with their names in some local languages.

Fish types suitable for culture in Ghana

<b>English name</b>	<b>Local name</b>
Akan	Ewe, Ga
Tilapia	Apatre or Mpatowa, Akpa, Dide
Mud Fish	Adwen, Adau, Adwen
Catfish	Adwen, Adau or Blolo, Adwen

Most often, harvesting matured fish takes place between 5-8 months after construction of the ponds. This, however, depends very much on the quality of feed and the types of management practices adopted. The type of fish feed the farmer requires is also very important. In conventional fish farming fish feeds make up over 60% of the operational cost. Fish could always obtain some amount of food in the water they live. This is a natural source and thus the food supplied is supplementary feed. Normally, fish feed twice a day; once in the morning and once in the afternoon. Several fish feeds are derived from major agricultural crops and by-products. Examples are shown in Table 2.

Sources of fish feed

Source Material	Ingredients
Cassava	Cassava leaves, roots, waste cassava dough, food remnants (fufu, gari, etc.), Raw cassava can be harmful to fish; boil or cook all cassava before feeding the fish.
Maize	Broken maize, maize bran, raw/cooked mill sweepings, kitchen left-overs (e.g. banku, akple).
Cocoyam or taro	Freshly chopped cocoyam or taro leaves
Rice	Rice bran
Fruits/Vegetables	Chopped pawpaw leaves or fruits, chopped garden eggs, tomatoes, palm chaff, cabbage leaves, carrots, various grasses.
Guinea corn	Pito waste
Livestock	Boiled offals of slaughtered animals, insects, termites, tailor ants, etc.
Oil palm	Palm kernel meal

## HANDLING TECHNICAL PROBLEMS

Much of the problems that marine fishermen are faced with are technical and these relate more to the handling of basic equipment such as the outboard motor. Some basic steps to ensure optimum performance of outboard motors are enumerated below.

Maintenance procedures for outboard motors

1. Check the level of the oil in the foot (gear box) as well as its colour; if this oil becomes greyish it indicates water in the gear box
2. Clean the petrol filter regularly
3. Undo the bowl of the carburetor in order to clean it properly, and check the quantity of the float-spindle (final adjustment)
4. Grease the different greasing points on the motor



5. Check the spark plugs with a tester and then the gap-sitting according to the instruction manual
6. Check the gap across contact-breaker points as well as their condition
7. Measure the combustion chamber compression with the tester.

### **SOME STATISTICS ON MARINE FISHING**

According to the Ghana Canoe Frame Survey for 2001 there are 17 coastal administrative districts in Ghana. The total number of fishing villages in Ghana are 185 and the landing beaches are 304. There are 9,981 fishing canoes and 5,256 outboard motors with horse power (hp) ranging from 25 - 40. There are 123,156 fishermen in Ghana.

### **Conclusion**

It is hoped that the fishermen would find the information useful to enhance their fishing activities. The next stage of the work would be to translate the document into the local languages.

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