

## **FIS 201: INTRODUCTION TO FISHERIES MANAGEMENT (2 UNITS)**

### **LECTURE NOTES**

Topics to be treated include:

1. The important fishes of West Africa with emphasis on Nigeria species.
2. Classification, evolution, morphology and basic structure of fishes.
3. The adaptation of fish to aquatic life.
4. Life cycle of principal species of fishes.
5. Significance of fishes in the life of Nigerians.
6. The fish industries in Nigeria.
7. Fundamental principles of fish management and production.

This course will be taught by 2 Lecturers and 2 Laboratory/field instructors.

(Prof Yemi Akegbejo-Samsons (Topics 5-7) & Dr {Mrs} N B Ikewinwe (topics 1-4))

The venues of the course shall be at the designated classrooms in the College of Environmental Resources Management and the University Fish farm/ hatchery centre.

### **Lecture 5**

#### **Significance of fishes in the life of Nigerians**

The topic will be treated with adequate reference to the role of fish and fish production (aquaculture) in rural development, through its relationship to food security and poverty alleviation, its contribution to rural development and other national attributes.

Aquaculture comprises diverse systems of farming plants and animals in inland and coastal areas, many of which have relevance for the poor. FAO defines aquaculture for statistical purposes as the *“farming of aquatic organisms, including fish, molluscs, crustaceans and aquatic plants. Farming implies some form of intervention in the rearing process to enhance production, such as regular stocking, feeding, protection from predators, etc.. Farming also implies individual or corporate ownership of the stock being cultivated”* (FAO 2001)

In the context of the rural poor, aquaculture often complements catches from traditional fisheries. The latter continue to play an important role and, in many areas, remain adequate to satisfy subsistence needs and provide a valuable source of cash income for farmers. In many cases, the capture or culture of aquatic species forms the basis for food security, enabling the use of livestock or cultured fish as a source of income generation.

Aquaculture becomes an attractive and important component of rural livelihoods in situations where increasing population pressures, environmental degradation or loss of access, limit catches from wild fisheries (IIRR *et al.* 2001).

### **The significance of fishes in the life of Nigerians include:**

- (i) Source of protein: - It's the cheapest when compared to other protein sources such as poultry, meat, beef, pork or mutton
- (ii) Employment:- creates employment in various sectors of the economy such as (a) jobs for over 500,000 fishermen in the coastal and riverine areas; (b) industrial trawling in vessels and small-scale shrimpers; (c) Sales of smoked fish, fresh fish, chilled fish in cold stores etc especially engaging the women fold; (d) employment for workers in the Research institutions, Universities and education centres.
- (iii) Income generation for Federal, State and Local government levels .
- (iv) Source of foreign exchange earning for the Federal government in particular and individuals who are involved in its exportation.
- (v) It gives opportunities for international cooperation in Nigeria such as membership of International organisations (FAO, UNDP, IFAD, CECAF etc. These organisations are channels for the provision of developmental funds for rural development in the coastal areas and fisheries sectors.
- (vi) Assist in rural development through direct government interventions to improve the livelihoods of the fishermen and other related stakeholders. For example, the intervention through DIFPRI in the early 80s, FADAMA III, ADP etc

### **Objectives of fisheries in Nigeria**

- (i) To increase fish production in the country by employing modern methods and techniques of fishing
- (ii) To exploit as profitably as possible the fisheries resources of the country.
- (iii) To improve the utilization of these resources by the introduction of modern methods of processing and marketing facilities
- (iv) To raise the standard of living and the socio-economic status of the fishermen, through the provision of outboard boats, nets, preservation methods etc
- (v) To train local fishermen and fisheries personnel in modern fishery management and operations
- (vi) To reduce the importation of fish to the barest minimum in order to conserve the much needed foreign exchange
- (vii) To increase fish production to the extent that we can export to other neighbouring countries, thereby earning foreign exchange
- (viii) To produce employment for fresh school leavers and other qualified cadres.

## **Lecture 6**

### **The Fish Industries in Nigeria.**

Like most industries in the world, the fishing industry can be divided into 3 major sectors:

#### **(A) ARTISANAL**

This is the small scale sector, usually organised by family unit. It is labour intensive and made up of 4 sub-sectors:

- a) Riverine and Lake Canoe fisheries
- b) Flood pond fisheries based on the exploitation of flood plains. This is seasonal.
- c) Coastal Canoe fisheries (along the coast and its made up of fishermen scattered along the coast line)
- d) Brackish water Canoe fisheries (along the creeks, lagoons, estuaries)

#### **(B) AQUACULTURE (FISH FARMING)**

This is the cultivation of fish in controlled environment for food purposes. It involves selection of sites for fish pond construction, proper construction, stocking and feeding of cultured species, management of pond water, pond bottom and harvesting of fish after culture period. This sector of the industry is very versatile and active involving many stakeholders and professionals such as pond engineers, fish health experts, nutritionists and geneticists.

#### **(C) INDUSTRIAL FISHERIES**

This is the use of high technology in form of equipments in the harvest, delivery and distribution of fish and fish products. It is capital intensive and requires the use of highly sophisticated technology. It involves a highly organised processing and marketing facilities.

The Industrial has 2 main sectors, vis (a) Inshore and (b) Offshore

The inshore is within the territorial shore of Nigeria while the Offshore is in the distant water fishing zone of the country.

There are various Fish Industries in Nigeria.

The different industries can be divided into the various fish production and utilization options.

#### **Type 1:**

Based on the production options, these industries include

##### **(a) The Aquaculture Industry**

- (i) Fresh fish production Industry such as Fresh water, Brackish and marine fish production ventures. These could be small scale or large scale.

##### **(b) Harvesting Industry**

- (i) Trawler subsector (trawler owners, fleet) artisanal groups in the rivers, creeks and lakes;

#### **Type 2:**

Based on Fish utilization options:

- (i) Industrial utilization sector- they convert the fish to either direct or indirect uses. Examples include the canning industries, Animal feed Industries (eg Pfizer Plc, Animal Care Plc etc
- (ii) Direct utilization sector: These include (a) Fish Smoking sector, (b) Sundried/ salting sector, (c) Chilled sector eg packed (chilled)fish importers etc

Note: Visits will be paid to some industries within and outside the state of Ogun

### **Industrial uses of fish**

- (a) Production of fish meal
- (b) Production of fish minced products
- (c) Production of fish protein concentrates
- (d) Fish silage production
- (e) Production of salted press cake
- (f) Production of patties
- (g) Production of oil products (OMEGA-3, Cod liver Oil etc)

## Lecture 7

### **Fundamental principles of fish management and production.**

The practice of aquaculture and fisheries management is influenced by some basic principles. These include:

- (a) Aquatic animals are dependent directly or indirectly upon plants for food. The need to know the trophic level of the fish is very important.
- (b) Ability to produce plant is dependent upon factors such as solar radiation, temperature, oxygen, nutrient availability etc
- (c) Natural fertility of water is largely dependent upon fertility of its associated soil and its sources. Soils contain basic nutrients which aid vegetative production.
- (d) Water fertility may be increased by adding inorganic or organic fertilizers.
- (e) Phytoplankton is the primary and principal food production groups of plants for organic aquatic animal production in oceans, lakes and ponds.
- (f) The longer the food chain the greater the energy loss. If the food chain is long, the energy loss will be high.
- (g) The carrying capacity per unit area is different for different species of fish depending on the trophic level of the species.
- (h) The greatest weight of any one species can be raised and produced in ponds by culturing only that specie.
- (i) The greatest weight per area of the species is obtained by culturing a combination of different species which differ in food and feeding habits.
- (j) The quality of feeds for a proper culture medium should contain the varying nutrients in the proper proportion.