

# **PROFERRING SOLUTIONS TO THE CHALLENGES IN THE FISHERIES AND AQUACULTURE SUBSECTOR NIGERIA**

*An Invited paper by the Nigerian-Belgium  
Chamber of Commerce*

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*October, 2021*

# INTRODUCTION

- Nigerian is a high fish consuming nation,(Biggest in Africa).
- about 2 million t/yr, about 60 % is imported.
- Domestic fish supplies major sources: (i) importation, (ii) Inland, (iii) estuaries, and coastal artisanal fishery, (iv) industrial trawl fishery, and (v) aquaculture.
- Coastal, brackish-water and inland fishery (30%)
- Industrial trawl fishery (4%); and,
- Aquaculture (15%).

# INTRODUCTION

- With the current population of about 200 million, the fish supply gap deficit is expected to be 1,270,000 MT. at current consumption per capita of 13.5 kg.
- If the target current global average annual consumption of about 16kg/yr, the total fish requirement will be 30% more than the forecasted demand.
- Capture fisheries have majorly been affected by piracy and militant groups in the marine waters,
- Aquaculture production have increased geometrically over the years since year 2000 especially in catfish and tilapia production.
- Aquaculture therefore remains the quickest way of meeting fish supply deficit.

# CAPTURE FISHERIES (Inland and Coastal)

- Inland fisheries sub-sector supports hundreds of thousands of rural-poor producers' livelihoods and millions of low-income consumers of fish.
- Inland fisheries is totally artisanal and crucial to rural communities as a source of employment, nutrition and income.
- **Constraints:**
  - environmental degradation,
  - overexploitation,
  - management difficulties (at national and local levels)
  - product value and economic loss.
- Constraints operate with varying intensity in different geographical regions and at different institutional levels.
- Consequently, can be divided into environmental, technical and institutional constraints.

# MARINE ARTISANAL FISHERIES

## ENVIRONMENTAL CONSTRAINTS

Range from man-made problems (water resources and agriculture), domestic and industrial wastes to climatic changes.

### Dam Construction and River Regulation

- Reduced catch through habitat loss: every square kilometre of inundated floodplain lost, a probable potential loss of 5 to 10 tonnes of fish.
- Reduced catch and diversity by prevention of river waters entering floodplains: reduces fish breeding potential, feeding opportunities, growth and production and biodiversity (estimated productivity reduced by 2t/km<sup>2</sup>).

# ENVIRONMENTAL CONSTRIANTS

## **Irrigated Agriculture**

- Possible loss of habitat through improved drainage and from the increased use of agrochemicals (fertilisers, pesticides, etc.).
- High levels of pesticide pollution in adjacent water bodies lead to fish mortalities, impaired growth and reproduction and increased susceptibility to disease.

## **Water Pollution**

Urban and industrial development often result in water pollution through the discharge of untreated domestic and industrial wastes.

## **Climatic Changes**

Serious periodic droughts experienced during recent decades, especially in the semi-arid northern part of Nigeria, results devastating impacts on inland fish populations and fisheries, (Lake Chad fishery collapse).

# TECHNICAL CONSTRIANTS

## **Inadequate Fisheries Information**

- The last Fish Catch Assessment Survey (CAS) system was carried out in 2007 covering both inland and coastal artisanal fisheries.
- The insufficient baseline information on the magnitude and dynamics of fish resources has weakened sector planning and management.
- Absence of fishing effort data derived from updated frame surveys precludes the application of fisheries production models needed to assess the current status of fisheries.

## **Fisheries Management.**

- Centralised fisheries management, planning formulation and establishment of statutory fisheries regulations by FDF with no updated law backing it.
- Weak enforcement of regulations.

## **The results:**

Ineffective fisheries management resulting in over-exploitation of adult broodstock fish in small perennial water bodies during the most critical dry season period.

# TECHNICAL CONSTRIANTS

## Solutions:

- develop fisheries management strategies based on the accurate identification of major constraints
- support and encourage the establishment of fisheries management systems using a partnership between government and traditional systems.
- Enact the Fisheries Act 2014 sponsored by the European Economic Commission.

## Post-harvest Fish Loss.

- Fish needed to be transported to urban markets or simple on-site fish processing methods that could lengthen storage life of fish be install in fishing communities.
- Fish processing methods: sun-drying or smoking or both.
- Traditional ovens are not efficient and do not produce high quality products.
- With fish loss, there is reduction in economic value of a poorly processed product.

# INSTITUTIONAL CONSTRAINTS

Several institutional constraints relate not only to the fisheries sector, but to its interactions with related sectors such as water resources, agriculture and pollution control.

## **Lack of Integrated Planning and Management Capability for Inland Aquatic Resources**

Insufficient communication, co-ordination and collaboration between water resource, agriculture, Environmental Protection Agencies, etc.

### **Results:**

- lack of integration between sector planning and policy formulation.
- Dams constructed for irrigation and water supply have caused immense damage to downstream fisheries, agriculture, livestock and wildlife.

### **Solutions**

Focussed on programmes designed to manage aquatic resources through the strengthening of integrated resource planning and management capabilities of Federal, State and local Government levels.

# INSTITUTIONAL CONSTRAINTS

## **Inappropriate Direction of the FDF Development Programs**

FDF must focus on:

- improved fisheries information collection methods,
- establishment of an effective fisheries extension services
- fisheries research institutes to refocus on adaptive research to respond to the changing needs of the fisheries sector.

## **Insufficient research on river and floodplain fisheries**

- Most research efforts on inland fisherie focusses on reservoir fisheries and aquaculture (80% of inland fish production is derived from rivers and floodplains).
- The disproportionate effort bears no relationship to the major constraints placed on the sub-sector nor to the immediate needs of artisanal fisheries.
- Future research should focus more on floodplain and river fisheries.

# MARINE ARTISANAL FISHERIES

Nigeria's marine artisanal fishermen value:

- Estimated 20.0 billion Naira at point of landing,
- Around 40 billion Naira in the retail markets.
- Fishermen's villages are mostly temporary camps located close to the sea
- Settlements lack amenities like drinking water, schools or clinics, electricity supply and no shops or stores, etc.

Fish catch from coastal artisanal fishing communities could increase by 70,000 tons a year and production value (at point of landing) by over 60 billion Naira, if these five major constraints:

- Increase mechanisation;
- Eliminate conflict with commercial fishing vessels (trawlers);
- Provide preservation facilities;
- Improve local transport; and
- Enhance access to higher quality processing and
- Facilitate higher value markets.

# MARINE ARTISANAL FISHERIES

## Mechanisation

- Only 20 per cent or less of coastal canoes are motorised.
- Near shore area up to five kilometers out, tends therefore to be over-fished
- Rest of the artisanal zone from 2 to 5 nautical miles offshore and beyond 40 and 50 kilometers, is relatively under-fished.
- The average low catch per canoe in Nigeria is due largely to a lack of motorised craft.

## Conflict Reduction

- Commercial fleet of shrimp and fish trawlers in Nigeria often fish within the 5 nautical mile zone exclusively reserved for artisanal fishermen.
- Artisanal fishermen loss amounts to 8,000 tons a year (N 8billion).

# MARINE ARTISANAL FISHERIES

## Access to Higher Quality Processing and Higher Value Markets

- Nigeria loses 15 to 20 per cent of its fish produce.
- If only 40 per cent of that loss could be prevented, the value increase in income would be in the order of billions of Naira to the fishermen and to the women fish smokers and fish sellers in the coastal fisheries alone.
- The absence of preservation and transport facilities therefore excludes artisanal fishers from the higher value markets

# MARINE ARTISANAL FISHERIES

## Effects of Oil Company Activities

- Estimated total of 2,800 square kilometres of the coastal sea area taken over by the oil industry for its extraction facilities.
- Coastal fishery may therefore be losing potential annual catches of up to 28,000 tons through the loss of access to these areas of the sea bed where demersal stocks are found.
- Physical presence of the oil installations, poses pollution from oil spills, leaks, and discharges, from the wells, pipelines, and terminals.
- Pollution results in juvenile fish mortality and spawning problems for coastal stocks.
- The effect may be reducing fish surviving to maturity by over 30,000 or 40,000 tons a year.

# MARINE COMMERCIAL FISHERIES

The constraints facing the commercial fishing industry:

- weak management structures,
- lack of confidence to invest in activities without substantial public assistance.
- Non adherence to defined rules and regulations (fishing within the 5 nautical mile zone).
- Heavy trawling gear causes long term ecological damage to the flora and fauna of the sea bed.

# AQUACULTURE

- Fish farming or culture (an aspect of aquaculture), a component of agricultural production system in Nigeria.
- Major species cultured in Nigeria include tilapias, catfish and carp;
- African catfish *Clarias gariepinus* is the most farmed.
- Nigeria is the largest African aquaculture producer, with production output of over 15,489 tonnes per annum, closely followed by Egypt with output of about 5,645 tonnes.
- Despite this great potentials, Nigeria still unable to bridge the gap in the short fall between total domestic fish production and the total domestic demand.

# AQUACULTURE

Actions needed to improve aquaculture development in Nigeria include.

## Government Policy:

- Government should encourage fish farmers by evolving a number of non-fiscal incentives: grants for development, government equity shareholding, government insurance, leasing of facilities and compensation schemes, subsidies for construction, equipment, supplies, labour and price support.
- Credit loans with deferred repayment schedules and loan guarantees made available.
- Strengthen contract arrangements between out growers and private companies

# AQUACULTURE

## Water

- Water, one of the most critical factors besides good feed/feeding in fish production.
- Water availability varies with the time of the day, season, weather condition, water source, soil type, temperature, stocking density, feeding rate and culture system.
- Major source of water for fish farmers: tap water streams/ rivers, wells and boreholes.
- Successful aquaculture venture calls for taking into considerations on dynamics and management of water quality in the culture media.
- Greatest challenges encountered is pollution from industrial activities, mining and the petroleum industries.

# AQUACULTURE

## Land

- Land availability for agricultural production in Nigeria involves a complexity of interacting variables such as population, land tenure system, level and type of technology to be deployed.
- These variables, especially land tenure systems put serious limitations on the amount of land that is available for aquaculture.

# AQUACULTURE

## Production and Management

Principal technical challenges in fish farming:

- Lack of and poor management of broodstock, (feeding and handling).
- Poor record keeping of all activities (spawning, care of eggs, fry, feeding, and general management of fingerlings).
- Others factors: capital, cost of labour, security, marketing, storage, preservation, distribution and transportation of fish and fish products.

# AQUACULTURE

## Feed and Feeding

- Complete diet supply with all the ingredients (protein, carbohydrates, fats, vitamins and minerals), necessary for optimal growth and health of the fish.
- Supplemental diet do not contain a full complement of nutrients needed but are used to help fortify the naturally available diets.
- Good nutrition in fish production system, essential for healthy, high quality fish products.
- However, high cost of feed in Nigeria has greatly increase cost of fish production due to lack of raw materials especially fishmeal (mostly imported) competes with livestock industry for feed production.

# AQUACULTURE

## Disease

- Diseases spread easily because of high density of stocking and intensity of feeding in limited water area.
- Some fish parasites may be highly pathogenic and contribute to high fish mortalities and economic loss.
- Some parasites have zoonotic potential in mammalian host including man thereby making them of public health importance
- Disease problems could therefore result in financial losses under intensive culture as well as a public health issue.

# AQUACULTURE

## Marketing and Distribution

- Seasonality, scarcity and means of preservation which are the main problems of fresh fish marketing.
- Transportation is also a major problem in fish marketing and distribution in Nigeria.
- Most fresh fish sellers travelled by road and some of the roads are bush tracks while others are tarred but in a state of disrepair.
- This reduces the volume of traffic on the roads and raises the cost of transporting fish

# AQUACULTURE

## Education/Extension Services

- Majority of fisheries scientists in Nigeria focus on technical aspects of aquaculture as major constraint facing aquaculture development.
- High availability of technical knowledge, overshadows the developmental and educational knowledge.

# AQUACULTURE

## **Most important constraints to aquaculture development:**

- Low dissemination of existing knowledge, whether derived from research or indigenous technical knowledge of farmers.
- Limited capacity of developing country institutions in education, research and development compounds this fundamental failing.
- Research not following farming systems research and extension methods with interdisciplinary teams work to evaluate and develop both production systems and extension methods that are appropriate to the local conditions and farmers resource base.
- Other critical problems: poor storage facilities, high cost of labour, high cost of transportation, lack of capital and poaching by birds, reptiles, and snakes.

# CONCLUSION

- There is the need for urgent attention to fisheries and aquaculture policies, laws and regulations that could facilitate the fish food system, food and nutritional security.
- In addition, quality assurance, standards and sustainable system that would be in harmony with Nigeria's demands for ecosystem and environment management should be the focus.