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A BUSINESS PLAN ON AQUACULTURE

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DATED ON THE 27TH, APRIL 2020

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Executive summary/ Brief Description of the project:

Introduction

Aquaculture is the production of aquatic animals and plants under managed and partially controlled conditions. It may be done for aesthetic or recreational purposes, e.g., aquarium keeping, water gardens, and sport fish ponds, but most aquaculture is for production of aquatic plants and animals for human consumption. Aquaculture is conducted by rural farmers in developing nations to supply food for their families. It also is done worldwide to produce fish and other aquatic organisms for domestic and international markets. Nigeria owns significant fisheries with a coastline of 853 km and over 14 million hectares of inland waters. The contribution of fisheries to the Nigerian economy is significant.

Types of Aquaculture

1. Mariculture: Mariculture is aquaculture that involves the use of sea water. It can either be done next to an ocean, with a sectioned off part of the ocean or in ponds separate from the ocean, but containing sea water all the same. The organisms bred here range from molluscs to sea food options like prawn and other shellfish, and even seaweed.

2. Fish farming: Fish farming is the most common type of aquaculture. It involves the selective breeding of fish, either in fresh water or sea water, with the purpose of producing a food source for consumption. Fish farming is highly exploited as it allows for the production of cheap source of protein.

3. Algaculture: Algaculture is a type of aquaculture involving the cultivation of algae. Algae are microbial organisms that share animal and plant characteristics in that they are motile sometimes like other microbes but they also contain chloroplasts that make them green and allow them to photosynthesize just like green plants**.**

4. **Integrated multitrophic aquaculture:** IMTA is an advanced system of aquaculture where different trophic levels are mixed into the system to provide different nutritional needs for each other. Notably, it is an efficient system because it tries to emulate the ecological system that exists in the natural habitat.

Benefits of Aquaculture

Economic Benefits

1. Alternative food source

2. Alternative fuel source

3. Increase Jobs in the market

4. Reduce Sea Food Trade Deficit

Environmental Benefits

1. Creates Barrier against pollution with mollusk and sea weed

2. Reduces fishing pressure on wild stock

Importance of Aquaculture

1. Sustainable use of sea resources

2. Conservation of Biodiversity

3. Increased Efficiency, more resources for less effort

Sponsorship, management and technical assistance:

Sponsorships:

1.The Fisheries society of Nigeria (FISON) was founded in 1976 by some few civil service based enthusiasts to promote the development of the fisheries profession and related disciplines in Nigeria, Africa and internationally. Today the membership of the society has expanded cutting across all the related disciplines including fisheries scientists, fishing companies and professional industrial fishing/fish farming enthusiasts and entrepreneurs.

2. The Nigerian Journal of Fisheries is aimed at encouraging needed research into multivariate fisheries development options for national and international benefits and also providing the

forum for dissemination of scientific findings in all aspects of fisheries for progressive development. It aims to serve individuals, industrialists and most importantly members of academia.

2. WorldFish has a long history of working in Africa, its aims to harness this experience, combined with its expertise in fish genetics, to boost aquaculture productivity and enhance nutrition and food security in Nigeria. World Fish will draw on its involvement and support from the African Union InterAfrican Bureau of Animal Resources to deliver this work.

3. Through our partnership with the University of Ibadan we are providing scholarships to national students and supporting them to conduct research to understand the magnitude of cross-border trade flows between Nigeria and neighbouring states.

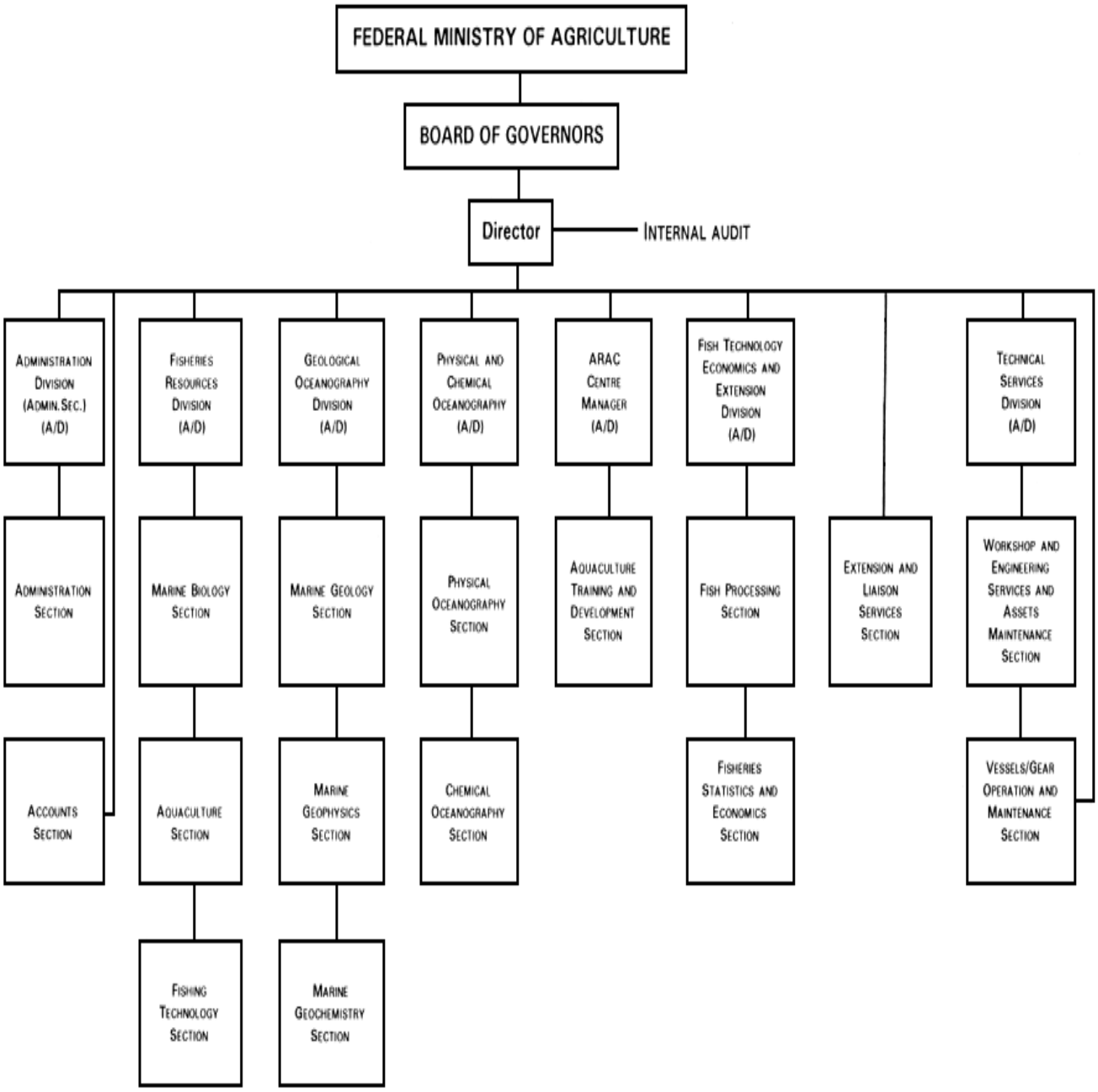
4. Through the Economic Community of West African States (ECOWAS) we are assisting the government of Nigeria and others in the ECOWAS block to integrate fish in their national trade strategies; promote cross-border trade on some selected One-Stop-Border-Posts (OSBPs); and promote participation of women in cross-border trade.

5. Our on-going work with the Fisheries Committee for West-Central Gulf of Guinea (FCWC), 6.the Regional Fisheries Body (RFB) has focused on;

(i) Documenting the value and contribution of small pelagic (mainly sardines) fisheries to the West-Central Gulf of Guinea region's food security and economy

(ii) Developing mechanisms for improving utilization and trade in these small pelagic through provision of information and trade networks for enhanced food security and incomes.

Management: A fish farm requires continuous proactive management. Aquaculture involves risk of crop loss due to wide pH fluctuations, oxygen depletion, parasites, water pollution, disease, predators, flooding, vandalism and more. A sound business plan and proactive management will help avoid or minimize these problems. Here the human resource factor is critical to a successful aquaculture enterprise. The changes that have taken place in Nigerian fisheries are reviewed with the major contributor to fish production in the Nigerian fishery sector which is the Artisanal fishery. By Nigerian Institute for Oceanography and Marine Research (NIOMR) on fishery resources in our coastal waters, fish and shrimps are being over exploited that they no longer sustain the number of registered vessels. The important ability of fisheries statistics for sustainable fisheries management and under-explored potential of Nigerian waters is also highlighted. The advantages resulting for fisheries sciences are examined and illustrated with examples and the understanding of some alleged weaknesses in some popular concepts and theories would enhance technology adoption with adaptation in making explicit inferences and decisions for the sustainable management of both the present and future situation of our fisheries resources.


FEDERAL MINISTRY OF AGRICULTURE
BOARD OF GOVERNORS
Director
INTERNAL AUDIT
ADMINISTRATION DIVISION (ADMIN. SEC.) (A/D)
FISHERIES RESOURCES DIVISION (A/D)
GEOLOGICAL OCEANOGRAPHY DIVISION (A/D)
PHYSICAL AND CHEMICAL OCEANOGRAPHY (A/D)
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FISH TECHNOLOGY ECONOMICS AND EXTENSION DIVISION (A/D)
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MARINE GEOLOGY SECTION
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AQUACULTURE TRAINING AND DEVELOPMENT SECTION
FISH PROCESSING SECTION
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ACCOUNTS SECTION
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MARINE GEOPHYSICS SECTION
CHEMICAL OCEANOGRAPHY SECTION
FISHERIES STATISTICS AND ECONOMICS SECTION
VESSELS/GEAR OPERATION AND MAINTENANCE SECTION
FISHING TECHNOLOGY SECTION
MARINE GEOCHEMISTRY SECTION

Technical Assistance: is the operational arm of the Fisheries and **Aquaculture** Department for translating the excellence of the **technical** expertise in fisheries and **aquaculture** into practical application in **support** and provision of **advice** to our member. These targets to strengthen and modernize training schemes in the fisheries and aquaculture sector and to support the improvement of production systems, particularly in the aquaculture sector.

i. Species choice – focus on the African catfish:
ii. Market forces
iii. Development of hatcheries:
iv. Investing in sound management
v. Fish farming villages:
vi. Development of fish feeds:

Market and Sales.

MARKETING OF FISH AND FISH PRODUCTS in Nigeria commences from the harvesting stage to the value chain where it then gets to the final consumer. Both men and women play key roles in the marketing and distribution of fish in Nigeria. In Aqua culture production, both men and women are involved in fish farming whilst the women dominate at the retailing level of the farmed fish products. In the capture fisheries sector i.e. trawling and Artisanal fisheries: the Men dominate at the production stage whilst the women are the key processors and sellers of the products.

EXAMPLE OF A NIGERIAN FISH MARKETING SYSTEM: THE TRADITIONAL FISH MARKETING SYSTEM is characterized by fishermen, landing their catches on scattered jetties in fish baskets along the coast, known as fishing villages.

• Their catches are often bought by women who often pay the fishermen in advance, thus acting as provider of informal credit.

• There is a strong interdependence between the women fishmonger and the fishermen which influence market decision by women.

• The marketing relationship between the fish traders and fishermen is often long-lasting, providing an assured market outlet to the small-scale artisanal fishermen and a source of steady supply to the trader.

CONSTRAINTS / CHALLENGES OF TRADITIONAL FISH SECTOR: Fish being a highly perishable commodity: high post-harvest losses are common due to lack of proper handling on board;

• Lack of suitable shore-based fish handling, collection, storage, marketing and distribution facilities.

• Deficiencies in marketing and distribution facilities.

• Poor communications which make it difficult to operate efficient fish collection and distribution systems and thus leading to the problems of establishing adequate fish marketing information systems.

• Inadequate or misdirected government intervention and assistance schemes e.g. due to lack of understanding of understanding of the prevalent socio-economic conditions in small – scale/Artisanal fisheries: establishment of costly organizations or large installations which cannot be used or of little use by the community.

• Inadequate price policies

CLASSIFICATION / TYPES OF FISH MARKETS IN NIGERIA: Consist of: Traditional smoked fish markets (packaging is a big problem)

• Fresh Fish Market (For captured fisheries, Artisanal fisheries)

• Live Cat Fish Market (For Aquaculture Products)

• Imported Fish Markets (Cold rooms, Refrigerated Trucks and other Modern Facilities/ Refrigerated Trucks)

• Industrial Fish Market (By Trawler Operators, with Cold Rooms Trawlers and other Modern Facilities - Refrigerator trucks)

• Introduction of Modern Fish Markets (By Federal Government of Nigeria since 2010 in 6 Geo-Political Zones of Nigeria. These model fish markets are fenced all round and within the fenced perimeters are found constant power supply, generator, borehole, processing house (of EU standard),Lock-up shops , Toilet facilities for both male and female; Special area for live fish, dedicated car park and conference room for the management. The Model Fish Market addresses some key challenges of inadequate infrastructure in the Nigeria fish value-chain; such as the maintenance of adequate power supply, continuous water supply, a steady and reliable avenue for various fish and fishery products data collection; as well as a very hygienic and conducive environment for business, and a standard processing house / centre for various types of fish and other fish product processing- Filleting, Salting, Smoking etc. the Model Fish Market solves the problem of glut as there is adequate information flow between the operators in the markets in the various Geo-Political Zones.

CHALLENGES: Seasonality, Post-Harvest Losses, inadequate power supply and distribution logistics.

• The high cost involved in fish preservation and storage thus leading to reduced profit margins is also a key problem of the fish value chain marketing in Nigeria.

• High transportation cost

• Lack of adequate access to local and international markets information.

• Youth are scared to participate in the industry.

- Genetic improvement: Dissemination of GIFT tilapia and improved catfish strains
- Researching fish feed and health
- Influencing youth and gender policies to increase women and youth participation and benefits derived from aquaculture and aquaculture-related activities
- Promoting consumption of fish by pregnant and lactating women, and by infants; and reducing postharvest waste and loss in fish value chains
- Integrating and enhancing the role of fish in domestic and regional trade

Technical Feasibility, Resources and Environment:

Technical Feasibility, this varies due to Location Cost of labour, Cost of materials, Cost of feeding, Cost of fingerling, Water and marketing

Resources,

1.Water and wastewater: The FEPA Interim Guidelines and Standards for Environmental Pollution Control in Nigeria (1991) set forth limitations on effluents and industrial emissions, as well as water quality standards (at point of intake) for industrial use. No specific reference is made to aquaculture. Furthermore, according to the Water Resources Decree, the Secretary for

Water Resources is in charge of regulating the safe disposal of sewage, effluent and water-borne waste and is responsible for the control and prevention of pollution.

2. Fish movement: The Inland Fisheries Decree provides that the import and export of live aquatic species is subject to an authorization to be issued by the Minister in charge of fisheries. Procedural details are not available in the reviewed legislation.

3. Disease control: No specific provisions on animal health and disease control were found.

4. Drugs: The matter is regulated by the Food and Drugs Act, Decree No.35 (1974). Unfortunately, a copy of this text could not be obtained.

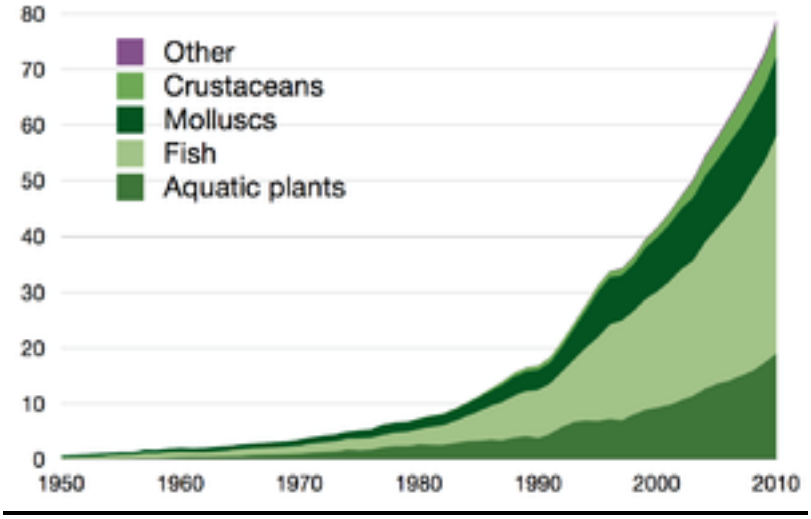
The National Agency for Food and Drugs Administration, created and regulated by the National Agency for Food and Drugs Administration and Control Decree (1993, as amended), is the competent authority for these matters.

5. Feed and Food safety: The Inland Fisheries Decree provides that the trade of fish or fish products treated with noxious chemicals, or otherwise contaminated or spoiled, is forbidden.

Environment: The environment in defined broadly as the whole ecosystem and its living and non-living components/resources, including human beings. Thus this paper addresses the effects of aquacultural practices to the environment, the impact of aquatic ecosystem on aquaculture, socio-economic impact of aquaculture development and lastly sustainability of aquaculture in Nigeria. EFFECTS OF AQUCULTURAL PRACTICES TO THE ENVIRONMENT Implimentationary Phase: The development of inland aquaculture facility (ponds) often results in disafforestation, displacement of resident macro fauna and mass destruction of soil micro and macro flora and fauna. For instance, there have been a number of accusations that fish farm

development has a negative impact on wildlife .The development of coastal aquaculture often leads to destruction of coastal mangrove and shoreline vegetations. Furthermore, the earth moved during construction has contributed to siltation of our waterways. Also, salt-water intrusion into some of these freshwater aquifers may be accompanied by Stalinization of soils thus resulting in further devaluation of already marginal agricultural land.

Timelines of the Project:



Estimated project cost and revenue:

This fish farming business plan is for the rearing Business Plan – Cost and Revenue Analysis of Fish Farming – 5,000 Fishes

G of 5,000 fishes to maturity. There are several ways a farmer can use to save money while stocking fish seeds or fingerlings.

This business plan suggests the buying of 15,000 fingerlings at N10 each which will make the cost of buying the fingerlings N150, 000.

The fishes are expected to be reared for 5 months and sold thereafter.

Cost Analysis

	1st Month	2nd Month	3rd Month	4th Month	5th Month
Cost of fish seeds	150,000				
Cost of feed	105,000	117,000	214,000	235,000	323,000
Labour Cost	15,000	15,000	20,000	20,000	20,000
Electricity/Power	10,000	11,000	10,000	10,000	15,000
Cost of operations	10,000	10,000	5,000	10,000	10,000
Miscellaneous	6,000	6,000	4,000	5,000	5,000
Cost of maggot and fat			50,000	50,000	
	296,000	**159,000**	**303,000**	**330,000**	**373,000**
Total cost from 1st -5th month	**1,461,000**				

Funding Mechanics:

Microfinance refers to loans, savings, insurance, transfer services and other financial products targeted at low-income people. Artisanal fishing is a crucial source of livelihoods in developing nations, particularly for low-income families in rural areas where job options are limited. Nigeria depends heavily on revenues from natural resources, especially oil hence income from fishing is particularly important to Nigeria. Aquaculture is also being practiced with a growth rate that has increased over the years. Sources of funding for the operators of these sectors of the economy who are mostly poor peasants will ensure sustainable production and income generation. Informal microfinance groups have existed before the advent of formal microfinance. Microfinance institutions in Nigeria operate in an environment that is dominated by commercial banks. However, their high deposit rate makes them attractive to the low income group. This paper examines the emergence of microfinance institutions, their contributions to fisheries and aquaculture and constraints to be overcome to enable them serve the fisheries and aquaculture sector better.

Conclusion:

The place aquaculture occupies in the current drive by the Federal Government to achieving self sufficiency in food production, especially in meeting the fish demand of the citizenry cannot be over emphasized, There is need for Government and its agencies to be more proactive and take conscious steps to tackle the problems that have been facing the sector. Among these problems are those caused by poor policy formulation, non-implementation of policies and programmers, lack of subsidy on fish feed as done to fertilizers used in crop production and non-availability of quality fish seed to stock ponds. Addressing the issue of food security in the nation is even more

critical when considered against the backdrop of the wide gap between fish supply which currently stands at 1.32 million metric tons and a demand of 2.66 million metric tonnes.In the light of the above, there is need for a more pragmatic and concerted approach to the development of aquaculture in the country. This is because this sector is a potential means of increasing the nation's fish production, to meet domestic needs and for export. In achieving this, it will involve a concerted effort by both governmental and non-governmental agencies. This can be achieved by an aggressive extension service by Fisheries extension officers educating fish farmers, prospective farmers and the general populace on the gains realizable from aquaculture venture as well as opportunities open for investment in aquaculture , through the value added chain such as Production of fishing equipment, Establishment of modern fish farms, Shrimp fishing, Establishment of an ice-melting plant, Fish processing for export, Fish fingerling production, Table size fish production, Brood stock production, Fish seed production, Ornamental fish farming, Production system design and construction, Processing and preservation, Capacity building in project management, Fabrication of fish handling equipment, Packaging and branding.