A

TECHNICAL REPORT ON

STUDENT INDUSTRIAL WORK EXPERIENCE SCHEME (S.I.W.E.S)

HELD

AT

TAQUA GOLD FEEDS ALSAABIS GOLD FARM NIGERIA LIMITED

Egbejila Village along Asa Dam Road Ilorin, Kwara State.

BY

ABDULGANIYU TIJANI

SUBMITTED

TO

DEPARTMENT OF PROCUREMENT AND SUPPLY CHAIN MANAGEMENT INSTITUTE OF FINANCE AND MANAGEMENT STUDIES KWARA STATE POLYTECHNIC ILORIN

IN PARTIAL FULFILLMENT OF THE REQUIREMENT FOR THE AWARD OF NATIONAL DIPLOMA (ND) IN PROCUREMENT KWARA STATE POLYTECHNIC

AUGUST TO NOVEMBER

CERTIFICATION

This is to certify that Abdulganiyu Tijani with Matriculation number ND/23/ESM/FT/0066 conducted this Student industrial work experience scheme (S.I.W.E.S) on **FISH FARMING, FEEDING FORMULAR AND POND MAINTENANCE.**

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ABDULLAHI SULAIMAN **Date & Sign**

(Siwes Supervisor)

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MR. YUSUF BUHARI **Date &Sign**

(Head of Department)

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ABDULGANIYU TIJANI **Date &Sign**

(Student)

DEDICATION

This Siwes report is dedicated to whom had always been my all-time support and the giver of responsibility that has not denied me life and To the Almighty Allah.

ACKNNOWLEDGEMENT

I appreciate My Parents Mr. & Mrs Abdulganiyu who not only went Through the Manuscript but also provided me with both Economic and Financial Support. May God Bless You Abundantly?

I won't forget my Siblings in the family of Abdulganiyu for the way god has been using you to enrich my literary Knowledge. My profound gratitude also goes to the Wonderful friends of mine who contribute immensely to the Success of this programme

Well-wishers are not left out and all people that leave no stone untouched to make this Programme to become reality.

Thanks.

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ABSTRACT

The paper discusses the Student Industrial Experience Scheme (SIWES), established in 2025 by the Industrial Training Fund (ITF), aiming to bridge the gap between theoretical education and practical application in various professional fields. It highlights the importance of practical experience for students in higher education, particularly in fisheries, emphasizing the skillset necessary for a smooth transition from academic training to industrial work. The document outlines the roles of different departments within the fisheries sector, including fish sampling, breeding, processing, economics, extension services, and nutrition, focusing on sustainable practices and productivity enhancement.

This book contains the technical report for the SIWES industrial training. It explains all that was done during the period of the SIWES. It also contains new knowledge and experience acquired by virtue of the industrial training. There are also some few suggestions as to who should be entitled to the industrial training being all students of tertiary institutions. The experience gained and knowledge acquired can never be got from any institution it has to be on the field and I think all students should have a feel of what work is like before going into it full time. Also it helps students to know where people in their field of study can work satisfactorily especially in their immediate environment.

CHAPTER ONE

INTRODUCTION

Fish farming or **pisciculture** involves commercial breeding of fish, most often for food, in fish tanks or artificial enclosures such as fish ponds. It is a particular type of aquaculture, which is the controlled cultivation and harvesting of aquatic animals such as fish, crustaceans, Molluscs and so on, in natural or pseudo-natural environments. A facility that releases juvenile fish into the wild for recreational fishing or to supplement a species' natural numbers is generally referred to as a fish hatchery. Worldwide, the most important fish species produced in fish farming are carp, catfish, salmon and tilapia.

Global demand is increasing for dietary fish protein, which has resulted in widespread overfishing in wild fisheries, resulting in significant decrease in fish stocks and even complete depletion in some regions. Fish farming allows establishment of artificial fish colonies that are provided with sufficient feeding, protection from natural predators and competitive threats, access to veterinarian service, and easier harvesting when needed, while being separate from and thus do not usually impact the sustainable yields of wild fish populations. While fish farming is practiced worldwide, China alone provides 62% of the world's farmed fish production. As of 2016, more than 50% of seafood was produced by aquaculture. In the last three decades, aquaculture has been the main driver of the increase in fisheries and aquaculture production, with an average growth of 5.3 percent per year in the period 2000–2018, reaching a record 82.1 million tonnes in 2018.

SIWES PROGRAMME

The Students Industrial Work Experience Scheme (SIWES) is a Skills Training Programme designed to prepare and expose Students of Universities, Polytechnics, Colleges of Technology, Colleges of Agriculture and Colleges of Education for the Industrial Work situation they are likely to meet after graduation. The Scheme affords Students the opportunity of familiarizing and exposing themselves to handling equipment and machinery that are usually not available in their Institutions. Before the establishment of the Scheme, there was a growing concern that graduates of our Institutions of higher learning lacked adequate practical knowledge and that the theoretical education in Higher Institutions was not responsive to the needs of the Employers' of Labour. It is against this background that the Industrial Training Fund (ITF) initiated, designed and introduced SIWES Scheme in 1973 to acquaint Students with the skills of handling Industrial equipment and machinery. The Industrial Training Fund (ITF) solely funded the Scheme during its formative years. However, due to financial constraints, the Fund withdrew from the Scheme in 1978. The Federal Government noting the significance of the skills training, handed the management of the Scheme to the National Universities Commission (NUC) and the National Board for Technical Education (NBTE) in 1979.

THE AIMS AND OBJECTIVES OF FISH FARMING INCLUDE:

- **Food production**: Fish farming provides a source of protein for human consumption.
- **Economic wealth**: Fish farming can be a profitable business that generates income for fishers and communities.
- **Employment**: Fish farming can provide jobs for fishers and community members.
- **Resource conservation**: Fish farming can help protect fish species from over-fishing.
- **Water management**: Fish farming can improve water management on farms.
- **Nutrition**: Fish farming can provide healthy fish of high nutritional value.
- **Community development**: Fish farming can stimulate economic activities in host communities.

  Fish farming can be integrated into existing farms. Fish farmers can select fish species with desired characteristics to raise.

  Fish farming can be done on a small scale for family consumption or on a large scale for commercial purposes. Fish farms can also help protect fish species from extinction.

OBJECTIVES:

Major Objectives of an integrated fish Culture are:

- To reduce operating costs and maximize the farmer's income.
- To develop a more economic ration for fish from wastes to useful fish protein production.
- To solve the waste management problem.

A central concern of fish processing is to prevent fish from deteriorating, and this remains an underlying concern during other processing operations. Fish processing can be subdivided into fish handling, which is the preliminary processing of raw fish, and the manufacture of fish products.

CHAPTER TWO

FISH PROCESSING

The term **fish processing** refers to the processes associated with fish and fish products between the time fish are caught or harvested, and the time the final product is delivered to the customer. Although the term refers specifically to fish, in practice it is extended to cover any aquatic organisms harvested for commercial purposes, whether caught in wild fisheries or harvested from aquaculture or fish farming. Larger fish processing companies often operate their own fishing fleets or farming operations. The products of the fish industry are usually sold to grocery chains or to intermediaries. Fish are highly perishable. A central concern of fish processing is to prevent fish from deteriorating, and this remains an underlying concern during other processing operations.

Fish processing can be subdivided into fish handling, which is the preliminary processing of raw fish, and the manufacture of fish products.

Another natural subdivision is into primary processing involved in the filleting and freezing of fresh fish for onward distribution to fresh fish retail and catering outlets, and the secondary processing that produces chilled, frozen and canned products for the retail and catering trades.

There is evidence humans have been processing fish since the early Holocene. These days, fish processing is undertaken by artisan fishermen, on board fishing or fish processing vessels, and at fish processing plants.

Overview

Fish is a highly perishable food which needs proper handling and preservation if it is to have a long shelf life and retain a desirable quality and nutritional value. The central concern of fish processing is to prevent fish from deteriorating. The most obvious method for preserving the quality of fish is to keep them alive until they are ready for cooking and eating. For thousands of years, China achieved this through the aquaculture of carp. Other methods used to preserve fish and fish products include:

IKEJIME method of fish slaughter.

- The control of temperature using ice, refrigeration or freezing the control of water activity by drying, salting, smoking or freeze-drying.

- The physical control of microbial loads through microwave heating or ionizing irradiation
- The chemical control of microbial loads by adding acids
- Oxygen deprivation, such as vacuum packing.

Usually more than one of these methods is used. When chilled or frozen fish or fish products are transported by road, rail, sea or air,

the cold chain must be maintained. This requires insulated containers or transport vehicles and adequate refrigeration. Modern shipping containers can combine refrigeration with a controlled atmosphere.[4]

Fish processing is also concerned with proper waste management and with adding value to fish products. There is an increasing demand for ready to eat fish products, or products that do not need much preparation.

CHAPTER THREE

FISH FEED

Fish feed is made by mixing ingredients like fish meal, vegetable proteins, and binding agents. The exact formula depends on the type of fish, its size, and the nutrients it needs.

Feedstuffs in Fish Culture. Feedstuffs are classified into major groups in fish culture - energy feedstuffs and protein supplements. 1. Energy Feedstuffs. These are feedstuffs containing less than 20% crude protein. They are essentially of plant origin. Examples are cassava, wheat offal, rice bran, maize, guinea corn, etc. 2. Protein Supplements. These are feedstuffs containing 20% crude protein or more. They are made either of plant or animal materials. Protein of animal origin are of higher quality than those of plant origin. Examples of animal protein sources in fish culture are 4 fish meal, bone meal, blood meal, etc. Soybean meal, groundnut cake and cottonseed cake are some examples of plant protein materials. A wide range of local feedstuffs such as agricultural by-products, animal meals, and on farm products are available in Nigeria for farmers to utilize in fish culture. The conversion ratio is presents to the dry weight of feed needed to produce one unit wet weight of fish. Allow conversion ratio means that fish will convert the feed into flesh more efficiently. High ratios indicate less efficient conversion. For example it takes about 4 to 6kg of ground maize, but 10 to 20kg of cassava peel to produce 1kg of fish flesh.

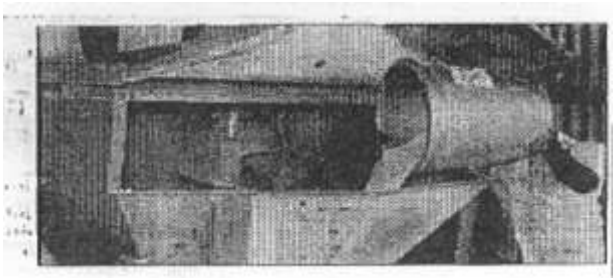
FEED FORMULATION

Feed Formulation: This is the method of combining selected ground feed ingredients in varying proportions to comply with predetermined nutrient requirements. When feedstuffs for desired % crude protein content have been chosen (as in section 3.0 of this bulletin), they can be prepared/compounded through a process of milling, mixing and pelleting. Milling can be carried out with the hammer milling **(Figure 1).**

Figure 1. Hammer Mill

Mixing of ingredients including the premixes can be performed by hand before adding warm/hot water with stirring to form dough. If cereals in the formula are not adequate to bind the particles of the feed mixture, cassava starch may be added as a binder. A mechanical mixer can be used for large scale feed production

(Figure 2) Mechanical Mixer



CHAPTER FOUR

MAINTENANCE AND SANITATION OF FISH POND

Fish pond maintenance and sanitation includes keeping the water clean, controlling weeds, and removing dead fish.

Water quality

- **Keep water clean**: Remove silt and weeds, and aerate the water to dissolve oxygen
- **Control weeds**: Cut grass on the banks and remove weeds from the pond surface
- **Remove dead fish**: Remove dead fish immediately and investigate the cause of death
- **Repair leaks**: Repair any leaks in the pond immediately
- **Control predators**: Keep fish-eating animals like birds and snakes away from the pond

Pond cleaning

- **Drain the water**: Drain the water from the pond
- **Pressure wash**: Pressure wash the pond liner
- **Trim plants**: Trim plants in the pond
- **Change filters**: Change the filters in the pond
- **Rearrange items**: Rearrange rocks, logs, or other items in the pond

Other maintenance

- **Sort fish**: Remove large fish from the pond to avoid competition for food and space
- **Feed fish**: Feed fish twice daily
- **Apply fertilizer**: Apply fertilizer once a month to promote the growth of fish food
- **Harvest fish**: Harvest fish regularly to prevent overpopulation, disease outbreaks, and cannibalism.

MANAGEMENT OF FISH POND

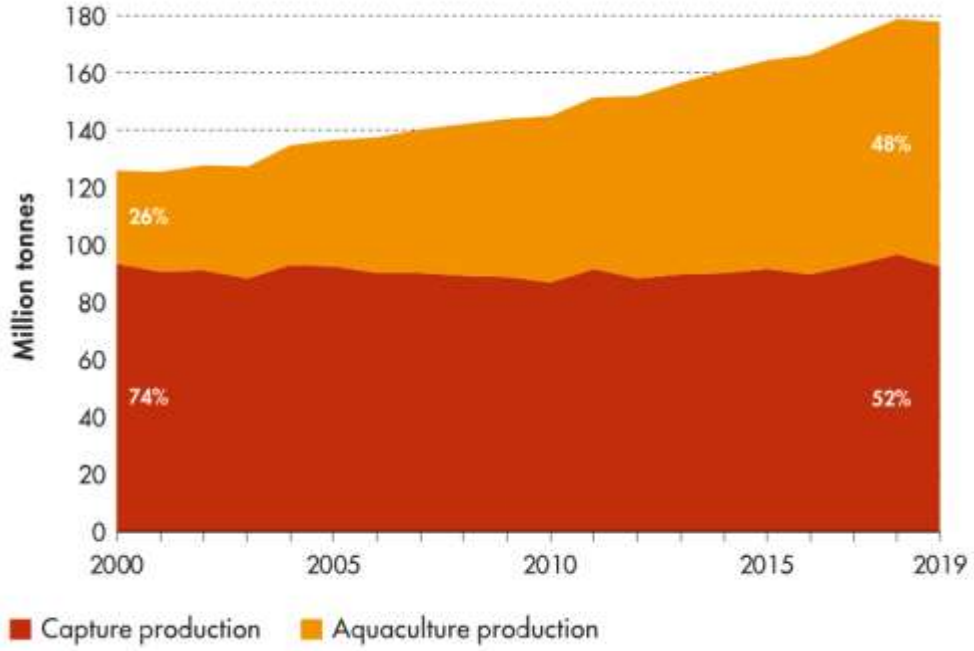
TECHNIQUES OF MANAGEMENT INVOLVE:

(i) Manipulation of pond ecology to ensure optimum production of natural fish food while maintaining the water quality parameters within tolerance limits of the stocked fish species.

(ii) The husbandry of fish through stock manipulation, supplementary feeding and health care.

ORGANIZATION

CHART



CHAPTER FIVE

CONCLUSION

In conclusion, this SIWES experience at the fishery farm provided a comprehensive understanding of practical aquaculture techniques, from pond preparation and water quality management to fish feeding and disease control, significantly bridging the gap between theoretical knowledge and real-world application in fish farming. The hands-on training in various aspects of fish cultivation, including brood stock management, larval rearing, and harvesting, equipped me with valuable skills to contribute effectively to the Nigerian fishery sector. While challenges like limited access to advanced technology and market fluctuations were observed, the overall exposure highlighted the potential for sustainable fish production through responsible farming practices, emphasizing the need for continuous research and development to optimize yields and address environmental concerns. This practical experience solidified my commitment to a career in aquaculture and provided a strong foundation for future endeavors in the field.

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