

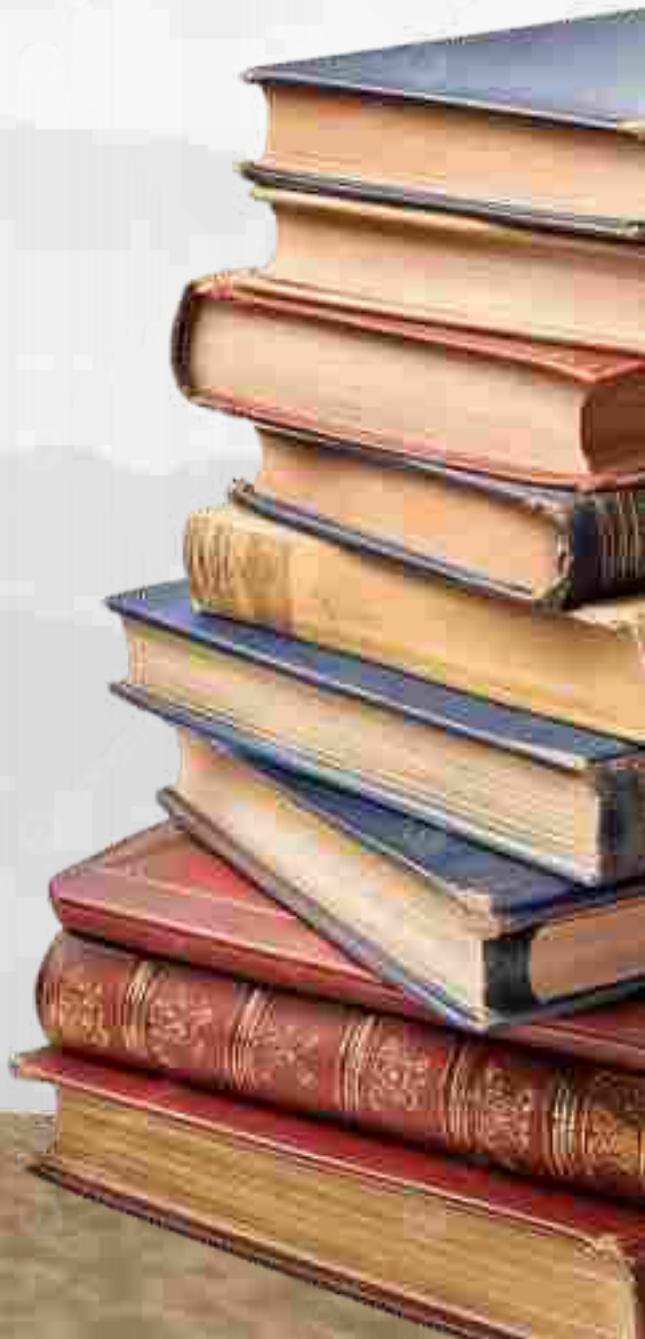


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PERSPECTIVE ON EDUCATION IN NIGERIA

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CHAPTER THREE

THE ROLE OF TERTIARY INSTITUTIONS IN FISH PRODUCTION DEVELOPMENT IN NIGERIA

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Abstract

This chapter examines the role of tertiary institutions (universities, polytechnics and colleges of agriculture) in promoting fish production in Nigeria. It outlines the concepts of tertiary education and fish production, reviews how institutions contribute through training, research, extension, and entrepreneurship, and highlights key constraints and opportunities. The chapter argues that strengthening institutional capacity, funding applied research, and expanding university–industry–community partnerships would significantly increase Nigeria’s aquaculture and capture-fisheries productivity and reduce reliance on imports.

Keywords: tertiary education, aquaculture, fisheries, Nigeria, research and extension, capacity building

3.1. Introduction

In the heart of Nigeria’s bustling markets, along riverbanks where fishermen cast their nets at dawn, and in rural communities where aquaculture holds the promise of food and income, one thing is clear: fish is more than just a meal — it is a lifeline. As Nigeria grapples with the challenges

of food insecurity, unemployment, and economic diversification, fish production emerges as a critical sector with untapped potential. Yet, unlocking this potential requires more than traditional practices; it demands innovation, research, skilled manpower, and structured development — all of which point to the significant role of tertiary institutions.

Tertiary institutions, particularly universities, polytechnics, and colleges of agriculture, are not just centers of learning; they are incubators of ideas, training grounds for future experts, and engines of national development. Over the years, these institutions in Nigeria have contributed to fish production through academic research, vocational training, technological innovations, and partnerships with government and industry. However, their impact — and the possibilities that lie ahead — remain underexplored in many discussions about agricultural development.

This chapter takes a closer look at how tertiary institutions in Nigeria have shaped and can continue to shape the future of fish production. It draws on real examples, academic insights, and practical outcomes to humanize the role of these institutions — not just as places with classrooms and laboratories, but as vibrant spaces where knowledge meets community needs, where students become change-makers, and where the future of Nigeria's fishery sector is quietly but powerfully being crafted.

This chapter discusses the concepts of tertiary education and fish production, and it examines the specific roles tertiary institutions play in developing Nigeria's fisheries and aquaculture sectors.

2.1. Clarification of Concepts

i. Concept of Tertiary Education

Tertiary education as a planned and organized educational system designed for the total development of man/woman and for the total transformation of the society through the utilization of teaching, research and provision of community service. The cardinal programme of tertiary institutions includes; teaching, researching and provision of community services (Ogunode, Edinoh & Okolie (2023). Tertiary education, also called post-secondary education, is any level of education pursued beyond high school, including undergraduate and graduate credentials. These credentials encompass certificates, diplomas or academic degrees. Tertiary education refers to specialized education in a specific field, taken on after finishing high school. Tertiary education is non-compulsory and provided in a specialist institution, usually a college, polytechnic or university. This form of education may be delivered virtually or at a distance (Top-hat, 2023).

Tertiary education is an organized educational system that is consciously designed for manpower production, in-service training and national development. Tertiary education is an education that advances teaching, research and community services for national development. Tertiary education is an education industry that is meant for the production of manpower and national development via implementation of teaching, research and provision of community services. The objectives of

tertiary education includes; to provide higher education opportunities via effective teaching, researching and provision community services; to develop produce students with specialized knowledge and skills for solving personal problem and national problem; to prepare student for national workforce and to contribute to societal and community development; to provide academic program of various disciplines; to provide quality instruction in field of studies and to conduct researches to generate new knowledge for national development and to solve complex problems (Ogunode, 2025).

ii. Concept of Fish Production

Fish production comprises both capture fisheries (harvesting fish from natural water bodies) and aquaculture (the controlled rearing of fish in ponds, tanks, or cages). Both subsectors contribute to food security, livelihoods and national income, but aquaculture is the fastest-growing source of fish globally and is central to closing Nigeria's domestic supply gap (FAO, 2022; Ogunji, 2023).

At its heart, fish production is the process of cultivating or harvesting fish for human use, typically for food, income, or industrial purposes. But to truly understand it, we must look beyond the textbooks and statistics. We must see the people, the stories, and the rhythms of life tied to this age-old practice (Abubakar, 2020).

a) What Is Fish Production?

In simple terms, fish production refers to the activities involved in producing fish, either through capture fisheries (catching fish from natural water bodies like rivers, lakes, and oceans) or aquaculture (the controlled farming of fish in ponds, tanks, or cages).

In Nigeria, this concept comes alive in different ways:

- A young man in Delta State wakes up at dawn to check his catfish ponds, measuring feed and watching for signs of disease.
- A woman in Kebbi State casts her net into the river, as her mother and grandmother did before her.
- A group of students at a university in Ogun State works together in a fish hatchery, learning how to raise tilapia from fingerlings to market size.

All these are part of fish production — a blend of tradition, science, labor, and hope.

b) Why Fish Production Matters

Nigeria's demand for fish is enormous. With fish being one of the most affordable sources of animal protein, millions of families rely on it to meet their nutritional needs. Yet, local production still falls short of meeting this demand, leading to heavy reliance on imports.

This gap presents both a challenge and an opportunity — and fish production stands at the center of it. For many Nigerians, especially in rural areas, fish farming or fishing is not just a job — it's a way out of poverty. It's a chance to send children to school, build a home, or start a small business. In that sense, every pond dug, every fingerling raised, and every kilogram of fish harvested carries a deeply human story. (WorldFish, 2023; Ogunji, 2023).

c) Components of Fish Production

- i. **Capture Fisheries:** This is the traditional method of catching fish from natural bodies of water. It's seasonal, often unpredictable, and heavily affected by environmental changes and overfishing. Yet, it remains a lifeline for thousands of artisanal fishers.
- ii. **Aquaculture:** This is the science and practice of raising fish under controlled conditions — in ponds, tanks, cages, or recirculating systems. It allows for year-round production, better control, and increased yields. It also brings technology into farming, empowering a new generation of tech-savvy fish farmers.
- iii. **Fish Hatcheries:** These are facilities where fish are bred and raised in the early stages of life. Hatcheries are critical for producing quality fingerlings — the baby fish that farmers grow to market size. Without good hatcheries, aquaculture cannot thrive.
- iv. **Feed and Nutrition:** Just like humans, fish need balanced nutrition. Fish feed production is a growing part of the industry, where farmers are learning to make high-quality feed using local ingredients to cut costs and improve results.
- v. **Harvesting, Processing, and Marketing:** Fish production doesn't end at the pond. Harvesting techniques, preservation methods (like smoking or freezing), and access to markets all determine the farmer's success. A fish farmer with no market is like a storyteller with no audience.

2.2. Roles of Tertiary Institutions in Fish Production in Nigeria

In the journey to feed a growing population and build a stronger economy, fish production in Nigeria stands as a beacon of hope — offering jobs, nutrition, and sustainability. But behind every successful fish farm, every improved fish breed, and every breakthrough in aquaculture technology, there's often a silent contributor: the tertiary institution. These institutions — universities, polytechnics, and colleges of agriculture — are more than just academic spaces. They are communities where ideas are born, where young minds are trained, and where innovation meets tradition. Let's explore their roles, not just in theory, but through the human impact they create.

i. Training the Next Generation of Fish Farmers and Scientists

In classrooms and field stations across Nigeria, young people are being taught not only how to raise fish, but how to think critically about fish farming — how to solve problems, improve yields, and adapt to climate and economic changes. A student in the Department of Fisheries at the University of Ibadan, for example, might begin her journey unsure of her future, but leaves school

equipped to manage a fish hatchery or start her own fish farm. These institutions don't just teach—they inspire. They produce extension officers, aquaculture experts, and entrepreneurs who go into communities to share knowledge and create jobs. Many graduates today are returning to their rural homes not to look for jobs, but to build fish farms — to become employers and agents of change (Ogunode, & Ayeni, 2024).

ii. Research and Innovation in Aquaculture

Research is at the heart of every tertiary institution, and in Nigeria, this research is directly impacting fish production. Whether it's developing disease-resistant fish breeds, creating cost-effective local fish feeds, or finding eco-friendly water management systems, these innovations often start in labs and fish ponds on campus (Ogunode, & Ukozor, 2024). Take the Federal University of Agriculture, Abeokuta (FUNAAB), for instance. Its researchers have helped develop better methods for catfish breeding and feeding — methods now adopted by smallholder farmers. These breakthroughs make fish farming more profitable and sustainable for ordinary Nigerians. Behind every paper published or experiment conducted is a team of passionate lecturers and students working long hours not just for academic accolades, but because they know their work can change lives (Ogunode, Ayeni, & Ogwuche, 2024).

Academic research in universities and research institutes supports improvements in broodstock management, disease control, feed formulation and eco-friendly production systems. Applied research has helped develop improved catfish and tilapia husbandry techniques that are being adopted by smallholder farmers (Ogunji, 2023; FAO, 2022).

iii. Community Engagement and Outreach

Tertiary institutions don't operate in isolation. Many have extension and outreach programs that bring their expertise directly to local communities. A lecturer might travel to a rural village on weekends to train farmers on pond management. Students on internship programs might help build fish ponds or set up small hatcheries in underserved areas. Through these efforts, knowledge is not hoarded in institutions — it's shared where it's needed most. These partnerships between "town and gown" are helping bridge the gap between science and practice, between what is known and what is done (Femi, 2019).

iv. Driving Policy and National Development Goals

Experts from universities and research institutes are often called upon to advise on national policies related to fisheries and food security. Their research informs government strategies on sustainable aquaculture, environmental protection, and youth empowerment through agriculture. This voice — grounded in evidence and experience — helps ensure that fish production isn't just growing, but growing smartly and inclusively. Tertiary institutions play a quiet but powerful role in shaping Nigeria's agricultural agenda (Peter, 2020).

v. Entrepreneurship and Incubation Hubs

Some institutions now run business incubation centers, where students and local entrepreneurs can get support to launch aquaculture-related businesses. They provide access to land, start-up ponds, mentoring, and even microfinance opportunities. This practical, hands-on approach transforms students from job seekers into job creators. It brings dignity to labor and shows that fish farming is not just a "fallback plan," but a viable and respected profession (Femi, 2019).

Conclusion

Tertiary institutions in Nigeria play a vital role in advancing fish production as part of the nation's broader quest for food security, economic growth, and sustainable development. Through teaching, research, extension services, and innovations in aquaculture, these institutions provide the knowledge base, skilled manpower, and technological solutions needed to expand the fisheries sector. By training professionals in fisheries and aquaculture, carrying out problem-solving research, and promoting improved production techniques, tertiary institutions help bridge the gap between traditional fish farming practices and modern, efficient methods.

Their contributions extend beyond the classroom into rural and urban communities, where outreach programs and collaborations with farmers enhance productivity and encourage best practices. Furthermore, partnerships between universities, government agencies, and private investors create an enabling environment for scaling up innovations and commercial fish production.

In essence, the role of tertiary institutions in fish production development is indispensable. Strengthening their capacity, funding their research, and aligning their programs with national agricultural policies will ensure a steady supply of skilled experts and modern technologies. This will not only boost fish production but also reduce dependence on imports, create jobs, and improve nutrition for millions of Nigerians.

Review Questions

1. What are tertiary institutions?
2. Define fish production.
3. Discuss four roles of tertiary institutions in fish production development in Nigeria.

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CHAPTER SIX:

GAMIFICATION IN SCIENCE EDUCATION IN NIGERIA

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CHAPTER SEVEN:

TERTIARY INSTITUTIONS IN NIGERIA AND HUMAN MANAGEMENT STRATEGIES

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CHAPTER EIGHT:

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CHAPTER NINE:

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CHAPTER THIRTEEN:

DEPLOYMENT OF ARTIFICIAL INTELLIGENCE FOR FRAUD DETECTION AND PREVENTION IN TERTIARY EDUCATION IN NIGERIA

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CHAPTER FOURTEEN:

DEPLOYMENT OF TECHNOLOGIES IN CURTAILING EXAMINATION MALPRACTICES IN NIGERIA TERTIARY EDUCATION

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CHAPTER SIXTEEN: TERTIARY EDUCATION IN NIGERIA AND CONFLICT MANAGEMENT STRATEGIES

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