NIGER DELTA UNIVERSITY
WILBERFORCE ISLAND, BAYELSA STATE.

59th Inaugural Lecture

FISHING FOR SOLUTIONS IN NIGER DELTA: THE DILEMMA OF A FISHERIES SCIENTIST

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Wednesday 23rd April, 2025.

Published by:
Niger Delta University Publishers Ltd
Wilberforce Island, Bayelsa State, Nigeria.
P.M.B. 071, Yenagoa, Bayelsa State
Email:ndupublishersltd@ndu.edu.ng

First Published 2025

ISBN: 978-978----------

Inaugural Lecture Series No. 59

NIGER DELTA UNIVERSITY

Wilberforce Island, Bayelsa State, Nigeria

Motto

Creativity, Excellence, Service

Vision

To be a centre of excellence defined by well articulated programme that will produce creative and innovative minds

Mission

To strive to maintain an international reputation for high quality scholarship, research and academic excellence for the promotion of thesocio-cultural and economic well-being of mankind

NIGER DELTA UNIVERSITY ANTHEM (THE BRIGHTEST STAR)

Like the brightest star we are, to lead the way
To good education that is all our due,
The dream of our fathers like the seed has grown;
Niger Delta University if here to stay.

Let us build on this noble foundation
And with love, let our dedication increase,
To rise and uphold this noble vision
Ev'ry passing moment let our zeal never decrease.

In all that we do, let us bring to mind
Our duty as staff and students of N.D.U
Ev'rywhere to promote peace towards mankind.
Creativity, Excellence and Service

CHORUS
Rejoice, great people old and new, rejoice
For the good fruit through us is shown;
Be glad in our worthy contribution
To the growth of humanity (x2)

CONTENT

Dedication

This Inaugural Lecture is dedicated to the Almighty God, my Creator, Enabler and Sustainer.

Protocol

Vice Chancellor Sir,
Deputy Vice Chancellor (Academic),
Members of the Governing Council,
Registrar and other Principal Officers,
Provost, College of Health Sciences,
Dean, Postgraduate School,
Dean, Faculty of Agriculture,
Deans of other Faculty, and Directors of Institutes,
Head, Department of Fisheries,
Other Heads of Department,
Distinguished Professors and eminent scholars,
Comrades of the Academic Staff Union of Universities,
Members of the Fisheries Society of Nigeria,
Great Whales,
Unique Uniport alumni,
Great Oceanites,
Gbarain people,
Members of Polaku Community,
Members of the Inebiegberigbagha Dynasty,
Members of Abuwari Community,
My Lords Spiritual and Temporal,
Great NDU students,
Gentlemen of the Press,
Distinguished Ladies and Gentlemen

Preamble

It is with gratitude to Almighty God and a deep sense of humility that I stand before you all to deliver the 59th inaugural lecture to this great University. I want to thank the Vice Chancellor, for creating the enabling environment for inaugural lectures in this University.

Vice Chancellor Sir, Ladies and Gentlemen, inaugural lectures are very important in a university system, as it is an opportunity to introduce a new Professor, who must have presented his research notes to justify his appointment. According to Amund (2000), inaugural lectures also afford the opportunity to bring the town and gown together in a celebration of academic excellence. He went further to quote the words of the former Vice Chancellor of University of Lagos, Prof. Jelili Omotola: "a Professor who didn't give an inaugural lecture is like a new-born child without a naming ceremony". According to him, an inaugural lecture is the main mode of celebration of a new chair in the University environment. A Professor, during the lecture may choose to achieve the following goals (Ogunye, 1981):

1. Concentrate on the development of the Department, if the lecturer is also the occupant of the chair to which the headship is attached.

2. A general topic where the Professor considers he has something fresh and stimulating to his audience.
3. Disseminating the lifelong research findings of the Professor within the general framework of his discipline.

I hope to stimulate this audience with some new ideas and at the same time reel out some of my research findings. Today, it is on record that this is the second inaugural lecture to be given by a Professor in the Department of Fisheries of the Niger Delta University. Prof. (Mrs) Abiodun Oluseye Adeyemo, *MFS* gave the first in 2016. This is also the fourth in the Faculty of Agriculture. It is therefore my singular honour to stand before this august gathering to present my lecture entitled "*Fishing for Solutions in Niger Delta: the dilemma of a Fisheries Scientist"*.

Mr. Vice Chancellor Sir, my first love was Veterinary Medicine, until my dad told me to pick admission form into the Fisheries College in Lagos, while waiting for admission into the University. I obeyed, but rejected the idea the moment I was offered admission into the Federal College of Fisheries and Marine Technology, Victoria Island, Lagos, to read Fisheries Technology. My argument was that it would be a waste of fund and a distraction to me.

My dad would not take that for an excuse, but, insisted I must "obey before complain". I obeyed and resumed studies in October 1991. However, during the orientation programme, when we were taken through facilities, equipment and sea going vessels of the College and the adjoining Nigeria Institute for Oceanography and Marine Research (NIOMR), Victoria Island, Lagos, I got fascinated and fell in love with fisheries immediately, and I said **"NO MORE GOING BACK".** Since then, I have had several opportunities to cross over to my original dream, but my love for fisheries will not allow me. This love has since ignited in me, a flame, which has fueled me into fishing for solutions anywhere I found myself, whether in the office, home, church, neighbourhood, classroom and even in the aquatic environment.

Before I was employed into the Department of Fisheries of Niger Delta University, as an undergraduate student, I had carefully observed the activities of two of my teachers in the Department of Fisheries in then Rivers State University of Science and Technology, Nkpolu-Oroworukwo, Port Harcourt, Prof. John Famokuma Alfred-Ockiya and Ven. Dr. Azikiwe Japhet Teigha Otobotekere, who were actively involved in several consultancy and research activities in Niger Delta. In addition, their brilliance and articulation in

explaining some fisheries and environmental phenomena in the Niger Delta attracted me into Fisheries Biology and Management. I love field work and travelling. And my mind was made up concerning my speciality in Fisheries.

And so, today I will be discussing my area of speciality, Fisheries Biology and Management, with the title, "*Fishing for Solutions in Niger Delta: the dilemma of a Fisheries Scientist"*.

In this lecture, I will be telling you what Fisheries Science entails, what we have been doing, the challenges we have faced in carrying out our mandate and the way forward.

1.0 Introduction

1.1 SOME DEFINATIONS

1.1.1 Fishery(ies)

Fisheries include all activities involved in the capture or culture of fish, from the producer to the consumer. Fisheries is also generically defined as a system comprising three diffused interacting units or components (Figure 1), namely:

- Fish
- Environment, and
- Man

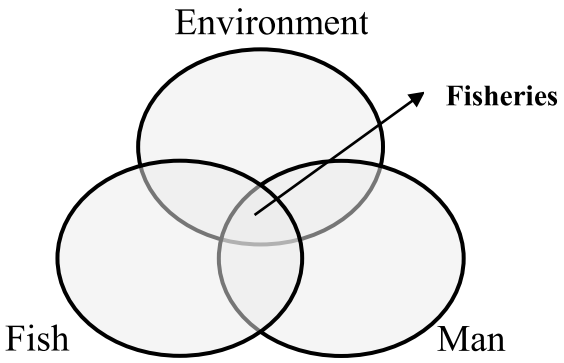

Figure1: The interacting units of fishery (Adapted from Lackey, 2005)

1.1.2 Fish: includes the plants and animals in the fishery e.g. phytoplankton, zooplankton, benthos, fin fish, shell fish and aquatic plants. Others may include crocodiles, sea

turtles, lobsters, crabs, octopus, dolphins, oysters, clams, sea weeds, etc.

1.1.3 Environment: includes the aquatic environment in which the fish resides. It includes the physical, chemical and substrate components, with their interactions within the fishery.

1.1.4 Man: All the human activities such as fishing, industrial, agricultural and domestic use/activities. All these activities affect the fishery one way or the other. This component of the fishery is perhaps the most poorly understood part of the fishery and the component that creates most of the problems in managing a fishery. If we consider the fish and environment units only, we refer to it as **Aquatic Ecosystem,** but, if the three units are taken together it becomes **Fishery**.

A good understanding of the entire system and its parts is important for successful management of a fishery, as each of the components affect the performance of the fishery (Lackey, 2005).

Fishery as a term can be viewed at, from a variety of perspectives like:

- Mode of production e.g., capture fisheries or culture fisheries.
- Level of Operation e.g., small-scale fisheries, artisanal fisheries or industrial fisheries.
- Target Species e.g., Bonga fishery, Sardine fishery, Tuna fishery, Shrimp fishery, Clam fishery or even Oyster fishery.
- Predominant fishing gear or craft employed e.g., purse seine fishery, gillnet fishery, canoe fishery, hook and line fishery, trawl fishery, seine net fishery or trap fishery.
- Water body e.g., Lake fishery, River fishery, Brackish water fishery, Swamp fishery, Floodplain fishery or even Sea or Marine fishery.
- Type of access e.g., open access fishery, open access with regulation fishery, limited access fishery, regulated fishery or private property fishery.
- Location e.g., Bayelsa fisheries, Nigeria fisheries, Lagos fisheries or Niger Delta fisheries
- Purpose of fisheries e.g., Commercial fisheries, Subsistence fisheries or Recreational fisheries.

1.1.5 Fishing

Fishing is the practice of harvesting aquatic organisms with the fundamental principles of hunting, filtering the water,

luring and outwitting the prey. Some fishing methods and gear include:
Gill netting: use of gill nets
Trawling: use of trawl nets
Seining: use of seine nets
Trapping: use of traps
Casting: use of cast nets
Trolling: use of long-lines

1.2 Importance of Fisheries

The roles/aims of fisheries in our economy may include:

- **Provision of Human Food**: Fish is an important source of animal protein for growth and body repair. Apart from the excellent quality of the protein, because of its essential amino acids profile, fish oil has a good complement of the Omega - 3 - fatty acid which is absent in most other protein sources. No wonder, our Lord and Saviour, Jesus Christ, chose to use fish as the animal protein to complete bread to feed thousands of people. Not beef, chicken or pork. Although, the World Fish Center reports annual per capita fish consumption for Nigeria as 11.3 kg, which is far below the global average of 21 kg (WorldFish, 2024), the Directorate of Agriculture and Rural Development – ECOWAS Commission, (2020) reported a lower estimate of 8.33 Kg. The

average intake of residents in riverine states of Nigeria, including Bayelsa State is about 80% (Areola, 2007), since it is often the most affordable source of protein (Kingdom and Alfred–Ockiya, 2009).

- **Source of Employment**: In many parts of Africa, fisheries and aquaculture provide alternative employment opportunities to the citizenry. In fact, FAO (2024) estimated over 6 million full-time part-time, occasional and unspecified jobs were provided by fisheries activities in African countries by 2022. Although, OECD (2020) reported that "over ten percent of the world population are economically dependent on fisheries as a source of employment".
- **Sources of Income**: Fisheries is source of income to millions of people over the world. Direct production, processing and marketing activities often produce employment which ensures regular income to residents. For instance, it was estimated that 30–45 million people in Africa depend on fish for their livelihood (World Fish Centre, 2005), while, almost a billion people on earth are estimated to depend on fish for all or part of their income (FAO, 2022).
- **Source of Foreign Exchange**: Fish is one of the most highly traded food commodity in the world

(World Fish Centre, 2005). Hence, if we promote trade in fish and fishery products such as shrimps, shark fins in response to the national, regional and global markets, we can earn foreign exchange. The total export value of all aquatic products reached a record high of USD 195 billion in 2022 (FAO, 2024).

- **Supplier of Labour**: A fishery comprises the fish, the environment in which the fish lives and its contents (other organisms) and the people that catch the fish. In a well-managed fishery, these components are in dynamic equilibrium. But where this equilibrium is distorted (e.g., mismanaged), the results may be over exploitation, environment degradation and unproductive and idle people. These unproductive people (fishers), hence become labour to other business ventures.
- **Source of Raw Material**: Fisheries, if properly managed is a potential source of various raw materials for industries. These include:
    - Fish meal and offal for livestock feeds
    - Fish oil for pharmaceutical industries
    - Bone meal for livestock feed
    - Fish scales for ornamentals e.g hand bags & jewelry
    - Shark fins for stitching threads in medical surgery

1.3 The Niger Delta?

The Cambridge dictionary defines a delta as “an area of low, flat land, sometimes shaped approximately like a triangle, where a river divides into several smaller rivers before flowing into the sea”

So, clearly, the Niger Delta fits this description as it is the delta of the Niger River, sitting directly on the Gulf of Guinea on the Atlantic Ocean in Nigeria. The Niger Delta is a veritably, densely populated region, and occasionally called the Oil Rivers, because it was once a major producer of palm oil in the pre-colonial era. The Niger Delta (covering about 7,000 square kilometres) is the largest delta in Africa and contains the largest mangrove (5,400-6,000 km^2) in the world (Afolabi, 1998).

The true or geographical Niger Delta is that portion of land mass (including water) transversed by the Rivers Nun and Forcados, including their distributaries. The true Niger Delta starts from Aboh (5º 33' 49" N, 6º 31' 38" E) in the north to Palm point (4º 16' 22" N, 6º 05' 27" E) in the south and from Benin River estuary (5º 44' 11" N, 5º 03' 49" E) in the west to Imo River (5º 27' 16" N, 7º 35' 27" E) in the east (NDES, 1997). Altogether, twenty-one (21) river mouths are found in the Niger Delta, twelve of which are in Bayelsa

State. So, you can imagine the enormous fisheries resources at our disposal.

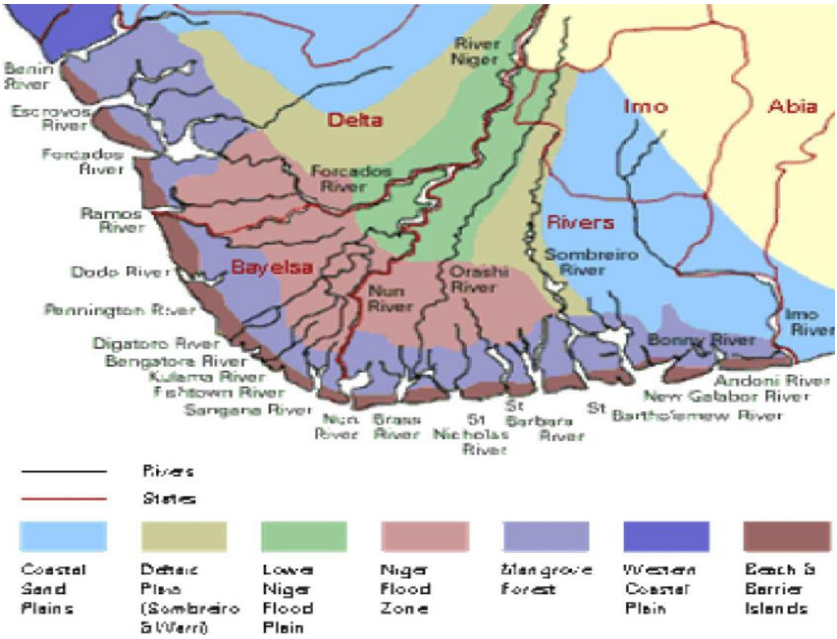

Figure 2: Map of Niger Delta, showing the river mouths
Source: Nduka and Orisakwe (2011)

Although, President Olusegun Obasanjo, in 2000, created the political Niger Delta, to include Imo, Abia, Cross Rivers, Edo, Akwa Ibom and Ondo states, there seems to be a confusion among the Nigerian politicians, on the difference between Niger Delta and Oil producing states.

All Niger Delta states are oil producing states, but, not all oil producing states are found in Niger Delta.

2.0 What does Fisheries Science entail?

Vice Chancellor Sir, the word of God tells us that fish was on earth before man was created. Genesis 1:21 states *"And God created great whales and every creature that moveth, which the waters brought forth abundantly, after their kind; and every winged fowl after his kind and God saw it was good".* And after successfully creating man, he handed over the management of these resources through a **divine mandate** in Genesis 1:28, which states *"And God blessed them (humans) and God said unto them, be fruitful and multiply, and replenish the earth and* ***subdue it****; and have* ***dominion*** *over the fish of the sea and over the fowl of the air, and over every living thing that moveth upon the earth".*

> Because mankind was created in His image, God gave men and women a privileged place among all creatures and commanded them to exercise **stewardship** over the earth (Genesis 1:26-28; Psalm 8:6-8), including the fisheries resources. Every fisheries scientist is carrying out this divine mandate of stewardship over our fisheries resources. Many, especially fishers and fish consumers, erroneously, understand this mandate of "subdue" and

"dominion" to mean exploit the resources maximally and indiscriminately.

Stewardship implies care taking, not abusing. We are to intelligently manage the resources God has given us, using all diligent care to preserve and protect them. This is seen in the Old Testament where God commanded that the fields and vineyards would be sown and harvested for six years, then left fallow for the seventh year in order to replenish the soil's nutrients, both to rest the land and to ensure continued provision for His people in the future (Exodus 23:10-11; Leviticus 25:1-7). This was also the tradition in Kalama, Sabagriea, where the Efi Lake was fished every seven years, until recently when it was reduced to every four years.

Fisheries Science is a blend of several disciplines in the study of fisheries. These disciplines include, but not limited to the following: Climatology, Fisheries Biology, Natural Resource Economics, Oceanography, Hydrobiology, Social Sciences, Aquatic Ecology, Limnology, Stock Assessment, Statistics, Fishing Technology, Computer Modeling and Geography. Fisheries Science is the study of manipulating structure, dynamics and interactions in an aquatic environment, fish populations and man in order to achieve

specific human goals and objectives. These objectives could be biological, social or economical.

Fisheries resources are finite and also renewable. Meaning, fin fish, shell fish, aquatic reptiles and mammals are exhaustible if managed poorly.

The main aim of Fisheries Science is to come up with information to manage fisheries. To play a key role in this assignment are fishers and Fisheries Scientists. No wonder, the first four disciples chosen by our Lord Jesus Christ were all fishers: Peter, Andrew, James and John. So, our duty as Fisheries Scientists is to ensure that the God-given fisheries resources are harvested **sustainably**. But, what do we mean by fisheries resources being harvested sustainably?

A fishery is sustainable when the amount caught does not compromise future catch. But, how do we know the quantity of fish that can be caught? This is where Fisheries Science comes into play. Fisheries Science answers this question through **stock assessments**. Stock assessment uses a variety of data to understand the health status of a stock and how much can be harvested. A fish stock is simply an exploited population. It refers to one specific species in one particular place, like Apoi Creek Clam, like Nun River Clupeids or Taylor Creek Prawns. It could also be a stock with many

species. The basic data needed for stock assessments are abundance, biology, and catch.

- **Abundance** is the population of fish in the stock; estimates of abundance are derived from samples using various sampling methods.
- Sampling will also help to generate data such as age and length (**biological data)** from which we can estimate mortality rates (natural and fishing mortality). Together, these data are used to make estimates that allow one to predict how many fish will be available the following year for fishing. During sampling, ecological parameters are also collected to understand their impact on fish populations.
- **Catch data** are records of fish catch, in number or weight, over a period of time.

From stock assessment data, fishery scientists produce mathematical models that predict how a fish population will respond to different levels of fishing. With this information, **fishery managers** can aim to maintain fish stocks (exploitable populations) near their **Maximum Sustainable Yield (MSY)**, the largest quantity of fish that can be harvested over indefinite period.

The idea of maximum sustainable yield (MSY), which has been the major goal of fisheries management (Larkin, 1977),

is an underlying model which relies on the principle of diminishing returns, where, as fishing effort (boats, fishing gear, fishers, capital) increases, fish catch in that same stock increases up to a maximum and if the fishing effort continues to increase, then fish catch decreases (Figure 3).

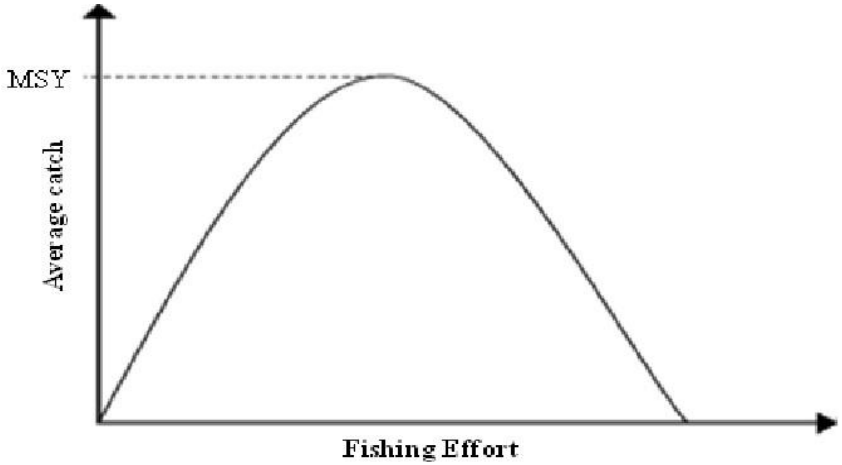

Fig. 3: Maximum Sustainable Yield Concept

A stock (or an exploitable population), being fished at maximum sustainable yield means the potential for fish as food has been achieved without negatively affecting the stock abundance in the future. The primary aim of the MSY is **conservation of fisheries resources**.

Interestingly, fisheries scientists and managers have gone beyond just achieving the biological objectives. We now

strive to achieve economic (Maximum Economic Yield, MEY) and social (Maximum Social Yield, MS_oY) objectives. The maximum economic yield (MEY) is an economic analogue to MSY and its objective is **profit maximization**. The MEY level is defined as the point on the revenue curve (i.e. the yield curve times the unit value of fish landed) where the greatest difference between the total costs of fishing (typically a straight inclined line) and revenues accrued.

However, as shown in Figure 4, the MEY will always be achieved at an effort level that is lower than MSY point on the curve. By implication, it is impossible to achieve MEY and MSY at the same time, which is a good example of a likely conflict between multiple objectives in fisheries management.

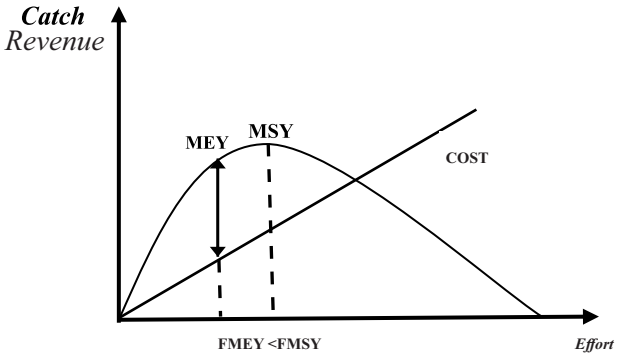

Fig. 4: Maximum Economical Yield Concept

Employment and **equity** are the major concerns of the Social objectives of fisheries management. Fisheries are not concerned only about fish landed and profit made, but also about employment numbers and ensuring that those involved in the fishery make a living that is both sufficient for current needs and capable of being maintained over time. Fishing is the most important source of employment in many coastal communities and in such situations, the goal is to have a large number of low income fishers might be more desirable than having a few rich ones (Figure 5). Also, part of the goal objective is to preserve the community structure and maintain their traditional lifestyles.

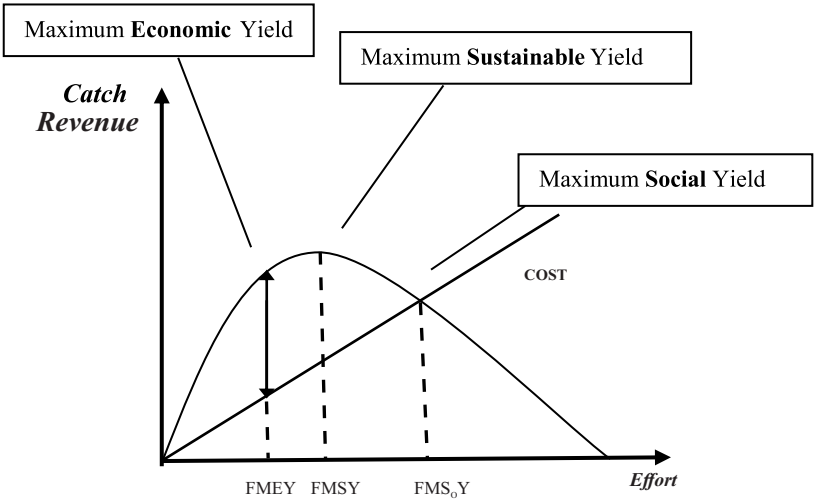

Figure 5: Representation of the the various fisheries objectives

2.1 Role of the Fisheries Scientist

Ultimately, the primary role of the fisheries scientist is to generate necessary information needed for sustainable fisheries management. These information lead to solutions in our environment. So, the whole idea of fishing for solutions in our aquatic environment, is to look for possible ways of solving our fisheries challenges in a sustainable manner. These challenges could be in form of:

i. **Overfishing**

Overfishing is a situation when more fish are caught faster than can be reproduced naturally to replace themselves. This can lead to decrease in fish populations and can have spillover effects throughout the aquatic environment. Overfishing can result to collapse of entire fish stocks and economic losses for fisherfolks. There are different types of overfishing, which include:

Growth Overfishing:

This exists when fish are harvested before they have the chance to reach maturity and reproduce, reducing the overall population size and the potential for future generations.

Recruitment Overfishing:

This occurs when the the fishing pressure is so high on the spawning stock biomass (the number of mature fish capable of reproducing), which is reduced to a level where it can no

longer breed enough offspring (recruits) to maintain the stock.

Ecosystem Overfishing:

This refers to the wider impact of overfishing on the entire marine ecosystem, including the loss of biodiversity, the disruption of food webs, and the degradation of habitats.

Economic Overfishing:

This occurs when the cost of fishing exceeds the value of the catch, leading to unsustainable fishing practices.

ii. Aquatic pollution

Aquatic pollution is a multifaceted problem that affect the fisheries sector. It includes various forms of contamination, including chemical pollutants, nutrient run off, plastic debris and other contaminants. Aquatic pollution is a major concern in the fisheries sector because of the potential impact it is capable of causing in the society. Some of the impacts include:

- Ecological impacts, such as loss of biodiversity, ecosystem degradation, food chain disruption and habitat destruction.
- Health problems, including respiratory issues, skin problems, and reproductive problems.
- Economic loss, due to significant reduction in fish populations, which can lead to a decline in the

fishing industry and a loss of livelihoods for local communities.

iii. **By catch menace**

Bycatch is the unintended capture of non-target species during fishing operations. Estimates show that forty percent of the total global fish catch is bycatch and this is seen as a significant problem facing the fishing industry today (Davies *et al.* 2009). A large portion of this bycatch is either returned to the sea dead, injured, or sold off on getting to the shore. For example, it is even more critical for shrimp in some fisheries, where in a kilogram of shrimp catch, 5-20 kg of bycatch may be found in the nets (Davies *et al*., 2009). This is a huge wastage of fisheries resources and may also result in the deaths of many marine animals, including endangered species, such as sea turtles and marine mammals.

Bycatch has environmental, economic and social impacts. Apart from the fact that it negatively affects the population of specific fish species, thereby disrupting the ecosystem balance, it furthermore, leads to economic losses for fishing communities, as it reduces the number of target species available for harvest and sale, which may also lead to fishing restrictions or loss of livelihoods.

The need to address this high level of bycatch is a major concern for conservationists to ensure the long-term health of our oceans and the communities that depend on them.

iv. **Illegal, Unreported and Unregulated fishing (IUU fishing)**

Illegal, unreported, and unregulated fishing (IUU) is a major global problem threatening the fishing industry today. IUU fishing refers to fishing activities that are operated outside the established legal and management frameworks, mostly done secretly, making it difficult to monitor and regulate.

Some examples of IUU fishing activities:

- Fishing without a licence.
- Failing to report catches or making false reports.
- Fishing for undersized fish.
- Fishing for fish species that are protected by regulations.
- Fishing during closed seasons or in closed areas.
- Fishing, using prohibited or banned fishing gear.

This type of fishing activities has grave consequences for the marine ecosystem and the fishing industry. According to the Friends of Ocean Action (2025), IUU fishing activities is costing the global economy an estimated loss of $10-23.5 billion USD per year.

3.0 Activities of some Fisheries Scientists Fishing for Solutions in Niger Delta

In Fishing for solutions in the Brass River Estuary, Sikoki and Hart (1999) carried out a frame survey of fishing communities and fish stock assessment, where they recorded 22 species of fish belonging to eleven families and reported that the area was being over – exploited.

Davies *et al.* (2007) also observed the release of industrial, laboratory and domestic wastes into the Elechi Creek, behind Nigerian Agip Oil Company and then Rivers State University of Science and Technology, and decided to study the levels of Iron, Zinc and Copper in the water, sediments and periwinkles in the Creek. They observed that the levels of Fe and Cu in the soft tissues of Periwinkles *Tympanotonus fuscatus* var. *radula* were above the recommended levels in food for human consumption and hence the consumers of Periwinkles in that Creek could be running the risk of food poisoning.

Francis *et. al* (2007) painted a worrisome picture when they evaluated exploitation rates of eleven fish species in Andoni River in Rivers State, and found out that five of them showed exploitation exceeded the optimal for sustainable yield.

In a bid to ensure rational exploitation of Freshwater Clupeids, *Pellonula leonensis* in the lower Nun River, Prof. Martin Allison and myself (Kingdom and Allison, 2007a; Kingdom and Allison, 2007b; Kingdom and Allison, 2009; and Kingdom and Allison, 2011), studied different aspects of the population dynamics of *P. leonensis* (locally known as *Isoun* in Izon) in the lower Nun River in the Niger Delta. We recommended the use of medium mesh size gill nets (12 mm) for harvesting Freshwater Clupeids, *P. leonensis* in the inshore and mid-water areas of the lower Nun River. We also observed that *P. leonensis* in the lower Nun River had an all-year-round reproductive pulse with peaks in May/June and September/October.

Having discovered that fisheries research in shrimps in Nigeria had been focused on the marine penaeid species caught offshore by commercial trawlers, as also reported by Powell (1983), while extremely little information existed on our endemic fresh and brackish water species, those supporting the traditional artisanal fisheries in Niger Delta and most likely to include suitable candidates for aquaculture, I, in collaboration with other Fisheries Scientists (Prof. Ibitoru Hart and Prof. Ebere Erondu) in Niger Delta, did several studies on the *Macrobrachium species* in the lower Taylor Creek area. Some of the studies included population dynamics of of Niger River Prawn

(Kingdom and Hart, 2012), population parameters of Brackish River prawn (Kingdom and Erondu, 2012a), *Macrobrachium* fishery (Kingdom and Erondu, 2012b), reproductive biology of African River Prawn (Kingdom and Erondu, 2013), Fecundity and Gonadosomatic Index of Niger River Prawn (Kingdom and Hart, 2013a), Relative efficiency and selectivity of Ingo traps (Kingdom and Hart, 2013b), effects of environmental factors on the abundance of shrimps (Kingdom *et al.,* 2013), morphology and condition indices of *Macrobrachium* species (Kingdom *et al.,* 2014) and demographic characteristics of African River Prawn (Kingdom, 2015).

We were able to establish the presence of three shrimp species (target species) belonging to the family Palaemonidae, that contributed as high as 88.87% and 71.10% by number and weight respectively in the local Basket (*Ingo*) Trap fishery in the lower Taylor Creek. *Macrobrachium felicinum* was observed to be the most predominant species by number (59.18%) while *M. vollenhovenii* dominated the catch by weight (39.15%).

We also established that *M. vollenhovenii* and *M. macrobrachion* were being under – fished, while *M. felicinum* was being over-fished in the Creek and

recommended that efforts should be concentrated in regulating the mesh sizes of the traps in the Creek.

In fishing for solutions in the Niger Delta, Kingdom and Alfred-Ockiya (2016) also carried out a fisheries survey of the Brass River Estuary and observed ten diffused fisheries types, fifty seven (57) fish species in 34 families, with Sardine, Croakers and Sailfish dominating. Interestingly, they observed the non-selective nature of the Ota fishery and recommended a total ban in the estuary. This has not been implemented till date.

4.0 Dilemma of a Fisheries Scientist in Niger Delta

"I believe that it may be affirmed with confidence that, in relation to our present modes of fishing, a number of the most important fisheries, such as the cod fishery, the herring fishery and the mackerel fishery, are inexhaustible. And I base this conviction on two grounds, first that the multitude of these fishes is so inconceivably great that the number we catch is relatively insignificant; and secondly, that the magnitude of the destructive agencies at work upon them is so prodigious that the destruction effected by the fishermen cannot sensibly increase the death-rate".
– T.H Huxley, at the International Fishery Exhibition in London in 1883.

The above statement is still being made in different fora and forms, even in Nigeria and Niger Delta in particular. The result is the decline of fisheries resources. Decline of fish stocks results in a decrease in seafood supply from the aquatic environment, economic loss, hardship to fishers and disruption of traditional ways of life. Overfishing, thus threatens the ecosystem, the sustainable use of fishing grounds and the livelihood of fishing communities. Thus, public ignorance is a major challenge that the fisheries scientist is facing.

The average Fisheries Scientist is in a dilemma. It is even worse in Niger Delta. How does a Fisheries Scientist provide reliable fish population figures, and have reliable catch estimates when fish cannot be counted in the numerous rivers and vast oceans? So, fish can be over-fished without being noticed because they are invisible in their environment. According to Cole (1998), any resource manager (including Fisheries Scientist) trying to be responsible to the need of future generations is often seen merely as crying "wolf" to an inattentive audience that has never seen the wolf. The public does not appreciate the activities and efforts of the Fisheries Scientists. The role of the Fisheries Scientist is misconstrued and may suffer social consequences for his or her research activities or views.

The Fisheries Scientist in Niger Delta, is in a dilemma, as he makes difficult decisions among multiple choices, arising from several stock assessment results, with some levels of doubts, and also include choosing or balancing between contradictory fisheries objectives of conservation, economic performance and social issues. Since, fisheries management decisions can significantly impact livelihoods of fishing communities, this, often leads to pressure on scientists, who now give preference to short-term economic benefits over long-term sustainability. Figure 6 shows the difficulty over achieving these three objectives at the same time.

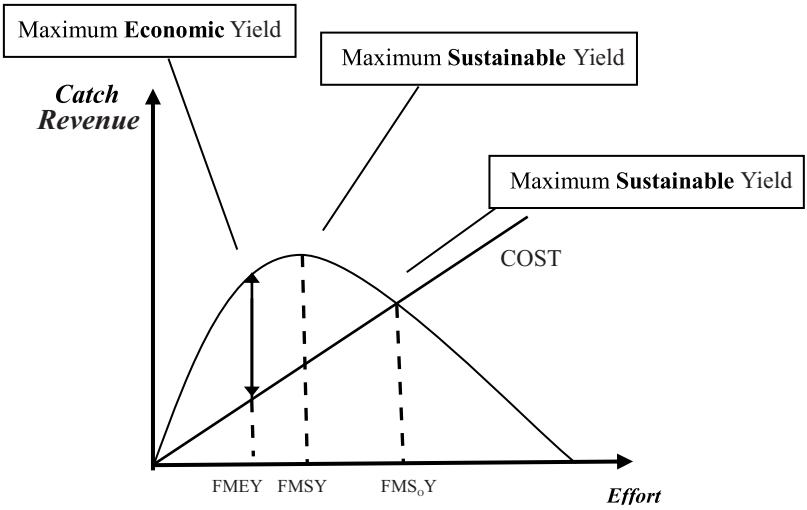

Fig. 6: Conflicting fisheries objectives

Fisheries, as part of a complex and intricate ecosystems, makes it difficult to isolate the effects of fishing practices and predict impacts on fisheries resources. Other factors, such as climate change and other anthropological activites, also affect fisheries resources that puts the Fisheries scientist in a fix.

Insecurity of the waterways is a major challenge facing the fisheries scientists in the Niger Delta. No meaningful research can be carried out in an insecured environment. Most of our estuaries in Niger Delta are either under studied or never studied. Fisheries scientist are at a fix when we talk about the estuaries in Niger Delta. The Fisheries Scientists in the Niger Delta must live before talking about the fisheries of Niger Delta.

Weak political governance is a major factor responsible for the poor state of our fisheries. Political considerations can sometimes override scientific advice, leading to management strategies that are not based on the best available data. About, 17 years ago, Bayelsa State Government decided to stock all the freshwater bodies with catfish (*Clarias gariepinus*) fingerlings, because, as they claimed, they wanted to boost fish production in the State. Some Fisheries scientists kicked against this move, because there was no environmental survey carried out to determine

the likely impact. Government went ahead with their plans. Nothing positive came out. The damage to the freshwater water environment of the Bayelsa State has not been evaluated till date.

5.0 Recommendations and way forward

Having established the dilemma the Fisheries scientists, fishing for solutions to myriad of challenges in the Niger Delta have found themselves, the following are recommended as the way forward:

i. Good communication

Uncertainties and limitations of scientific data should be clearly explained to stakeholders to solve the problem of ignorance. The Extension units of the various State Departments of Fisheries should be empowered to carry out vigorous sensitization programmes in Niger Delta.

ii. Stakeholder engagement

Various stakeholders should be involved in the decision-making process to build consensus and understanding, before taking decisions.

iii. Interdisciplinary collaboration
Fisheries scientists should work with experts from different fields of social sciences, to address the complex social and economic aspects of fisheries management.

iv. Adaptive Management Strategies
Fisheries scientists and managers should work out flexible management strategies that can be adjusted based on new data and monitoring results.

v. Improve security
Government should improve on the security of the waterways. Government can do this by strengthening monitoring, control and surveillance of Nigeria' Territorial waters and also protecting our Exclusive Economic Zone from pirates and those involved in IUU fishing. This will help to dispel fear and encourage more fisheries research especially in our estuaries and Territorial waters.

vi. Politics is very important even if fisheries scientists would prefer to ignore it. Politics plays a crucial role in several decisions that affect fisheries in Niger Delta. So, fisheries scientists must be involved in one way or the other at ward, local government, state or national level, so as to influence fisheries policies positively. This is not a call to snatch ballot boxes, but, a call to stop agonizing and start

organizing. We need focused and responsible leadership at every level in Nigeria. Government should prioritize the long term concerns of the environment over short term gains. Government should work with our fisheries scientists to ensure workable policies.

6.0 Future Research

Mr. Vice Chancellor Sir, my future research interest is geared towards applying Artificial Intelligence, Remote Sensing and GIS technology in fisheries studies in the Niger Delta.

We hope to analyze and visualize spatial data related to aquatic ecosystems, which is a critical tool in understanding the distribution of habitats, identifying vulnerable areas, and planning conservation strategies.

We also hope to do a by-catch analyses of all fishing gear in use in the Niger delta, so as to reduce their impact on the aquatic ecosystem.

7.0 Conclusions

Mr. Vice Chancellor Sir, the Fisheries Scientists are willing to provide solutions to fisheries problems in Niger Delta and beyond. But, a combination of forces has limited their resolve to carry out their divine mandate. The Fisheries Scientists in Niger Delta need encouragement to carry out their divine mandate to manage the fisheries resources. All

stakeholders in the fisheries ecosystem of Niger Delta must join hands with the Fisheries scientists to make our fisheries sustainable.

Acknowledgements

Mr. Vice Chancellor sir, the Almighty God has been very merciful and gracious to me. I have faced tremendous challenges and afflictions, too numerous to mention, but God has seen me through **ALL** of them. And so, words cannot express my appreciation to God who has been my helper and has brought me this far. Thank you, God Almighty.

I am most grateful to my academic father, Professor John Famokuma Alfred-Ockiya, Fellow of the Fisheries Society of Nigeria, who saw the potentials in me and decided to pick me and nurtured me both academically and professionally. Prof., you are a trail blazer and a living ancestor in the fisheries profession, nationally and internationally. Like you will always say, "may God bless you the more".

Let me specially appreciate Prof. (Mrs) Aduabobo Ibitoru Hart, and Prof. Ebere Samuel Erondu, both fellows of the Fisheries Society of Nigeria, who jointly supervised my Ph.D. research work at the unique University of Port Harcourt. They made my Ph.D. programme look as if it was just a take-home assignment.

I wish to also appreciate all my teachers who had taught me from Primary School to the University levels. Specifically, Late Miss Araida of Army Children School, Apapa; Late Mr. Patrick Adesooju, Mr. Ulu, Mr. Olutayo Sowemimo, Mr. Shemidara and Mr. Moses Ebikabowei Willy of Tin Can Island High School, Lagos; Mr. John Affah, Mrs. Elizabeth Mangai, Dr. Issa Adenigba, Mr. Tony Ebietomiye, Dr. Olukayode Olubiyi and Dr. J.J. Jinadu, all of Federal College of Fisheries and Marine Technology, Lagos. At Rivers State University of Science and Technology, Port Harcourt, I will not forget the contributions the following persons made in building me: Ven. Dr. A.J.T. Otobotekere, Prof. Martin E. Allison, who supervised my M.Sc. research work, Prof. Reginald I. Keremah, Prof. Commander C. Tawari, Prof. (Mrs) Onome A. Davies-Bubu, who supervised my B.Sc. project, Prof. S.N. Deekae, Late Prof. U.U. Gabriel, Late Chief M.B. Inko-Tariah, Prof. Jasper F.N. Abowei, Prof. A.D.I George and Late Dr. S.S. Ovuru. Most importantly, may God bless the soul of Mr. Akin Olaniawo, the former Provost of Federal College of Fisheries and Marine Technology, Victoria Island, Lagos, who God used to dismiss me from the institution, and changed my direction of growth completely. He also toughened me for today. Thank you sir.

I acknowledge with deep sense of appreciation, the KOP-NFP fellowship awarded to me by the Netherlands Government to attend a Short Course on *"Ecosystem Approach to Fisheries: monitoring and evaluation of resource use and fisheries impact"* at Wageningen Centre for Development Innovation, Netherlands. I gathered a lot of lessons there that shaped my thoughts.

I wish to acknowledge with gratitude, my colleagues, who mostly were my teachers in my undergraduate and postgraduate days. Most of them have already been mentioned. I want to specially appreciate, Prof. Abiodun Oluseye Adeyemo, who was on ground to receive me into the Department on the 18th of October 2005 and the current Head of Department, Prof. Ogaga A. Aghoghowvia. Others include Dr. Edubamo D. Binaebi, Blessing Ogonodi and many others in the Faculty, such as Prof. Inetiminebi Arrow Ogidi, Prof. Timothy T. Epidi, Prof. Gaskin Ayolagha, Prof. Philip C.N. Alikwe, Prof. Beke T. Sese, Prof. Edmund Allison-Oguru, Dr. Michael Ockiya, Dr. Ruth T.S. Ofongo, Dr. Azawei Alamene, Dr. Achimota Dickson, Prof. Prince E. Kainga, Late Dr. Felix I. Iruo, Dr. (Mrs.) Custodian Nnadi, Mr. Ebiware E. Sikpi, Dr. Jasper Ezewanka, Mr. Joseph O. Tate, Dr. Josiah Ikuli, Mr. Nimiye Morgan, Dr. Abraham G. Ominikari, Dr. Preye S. Jimmy, Mr. Japhet B. Yeigba, Mrs. Iteimoere P. Fasingha, Mr. Erebuokumo M. Bai, Dr. Mouna

Kosouwei, Mrs. Inemotimi Abadida, Ms. Dobie A. Wasini, Mr. Williams Agbai, Ms. Diepriye Denton-West and Mr. Benatari B. Agadaga. Not forgetting the non-teaching staff, ably led by the Faculty Officer.

I also appreciate my professional colleagues, who are so numerous to name. But, I have to recognize my good friend, Dr. (Mrs) Ebinimi Joe Ansa, *ffs*, National President of Fisheries Society of Nigeria (FISON), Dr. Lukman Adegoke Agbabiaka, *ffs*, the immediate past President of Fisheries Society of Nigeria (FISON) and Rector of the Federal Polytechnic, Ekowe, Prof. Francis David Sikoki, *ffs*, the immediate past Chairman, Council of Fellows of FISON, Mr. Augustus Eli, Bayelsa State Chairman, Elder Garrick Oginike, Chief Ebimonyo Ikuromo and Hon. Anderson Emmanuel, former Chairmen of FISON, Bayelsa State. Not forgetting Dr. Keme-iderikumo Kwen, Dr. Tony Binyotubo and so many others that space will not permit.

I cannot forget some of the clergymen who God has been using to guide me spiritually. Worthy of mention is Rt. Revd. Funkuro Godrules Victor Amgbare, Bishop of Northern Izon Diocese (Anglican Communion), Rt. Revd. Nixon Akpotunumubofa Enekeme, Ph.D, Bishop of Diocese of Niger Delta West (Anglican Communion), Rt. Revd. Ife Okukpevi, Bishop of Diocese of Lagos (Anglican

Communion), Venerables Inoru David Inoru, John M.A. Torunana, Joseph Zibe, Woyengikuro Ikoni, Ayi Israel Okadi and Godspower Angalapu, Revds Ebinipre Enisuoh, Sunny Seiba, Manson Taribowei, Righteous Ombu, Oyins Felix, Kenneth Eze and many others. I also acknowledge Revd. and Mrs. Temple Amangala, who housed me during my M.Sc. studies in the then Rivers State University of Science and Technology, Port Harcourt.

In the same vein, I appreciate all the teachers in the Anglican Children Ministry in the Diocese of Northern Izon. But, to mention a few, Ineinkade Pere and his beautiful wife, Esther, Sunipre Suokiri, Matthew Adere, Seigha Dudu, Ongonimi Fekumo, Mathias Avendei, Solomon and Daniel Agbada, Miebi Pere, Doubara Fubara, Inemotimi Ikidi, Ebimunu Ingiabuna, Tari Orudiakumo and so many others.

I cannot forget my siblings and their families, who struggled with me in those difficult days. Mrs. Boloubelemoere Hannah Yabrifa and her husband, Mr. Douglas Yabrifa, Late Mrs. Dinipre Esther Ekpebu, Mrs Christiana Mandy and her husband, Mr and Mrs Izonfadei Emmanuel Barakabo, Mr. and Mrs. Theophilus Waibodei, Mr. Woyengiemi Solomon Barakabo (popularly known as Bara Sax), Mrs. Bodisere Ruth Isari and her husband, Mr. Alex

Isari, Mr. Woyengidoubara James Barakabo and Mr. Funkeyi Waibodei.

I also acknowledge the contributions of the descendants of Inebiegberigbagha in my journey so far. Worthy of recognition is the family Head, Chief J.D. Barakabo, the oldest man, Elder James Jato Suwari, who is also the Proprietor of Jato Group of Schools and Mr. Pretowei Topman Suwari, the Bursar of the Federal University Otuoke. I cannot forget Ibarafakumo Eberegu a.k.a. Coolyman and Dr. Ebiemieowei Demus Barakabo, both who housed me during my undergraduate days at Agip waterside, Port Harcourt. Others worthy of mention include Prof. Koku K. Obiayai, Dr. Achimota A. Dickson, Dr. Gods'time S. Suwari and Mr. Boufini Jacob Kenigua. I also recognize the unquestionable and undiluted love of Late Mr. Godknows Jacob Kenigua, my reliable and very dependable cousin, who took charge of my siblings while I went to school. Your labour shall not be in vain.

I celebrate my dad, Late Sgt. Kingdom Daniel Barakabo a.k.a *Addis Ababa*, who seriously felt it was his lack of secondary education that kept him where he was and vowed that all his children will not follow the same route. I still remember vividly how he borrowed money severally to pay my school fees and to buy books. I admire his courage and

tenacity. To add to this, he was a workaholic servant in the vineyard of God before his ascension to join the church triumphant. *Addis Ababa*, I will continue to celebrate you, as long as I live and to inform you that we did not disappoint you. I will not forget my mum, Mrs. Koridigha Gogori nee Mieseigha and my foster father, Apostle Godbless Gogori, who have been a pillar of support. I also appreciate my uncle, Mr. Diri Mieseigha, his wife, son Lieutenant Ebipanipre Gabriel Mieseigha and other members of the Mieseigha family, for their show of love and care.

I acknowledge the comradeship of the Principal Officers, Trustees, Zonal Coordinators, members of the National Executive Council, Branch Exco and NDU Congress members of Academic Staff Union of Universities (ASUU), my immediate constituency. Your solidarity has built in me confidence to face any force on earth placed before me. I will continue to participate in all ASUU struggles to free all oppressed people anywhere they may be found. I also appreciate the comradeship and support of Comrade Ebiserikumo Jason Gbassa, “the Commando”, who stood by me during the dark days in the trenches as a student, when I was dismissed.

I will not fail to recognize three comrades who have played a major role in my life in this University, so far. Prof. Samuel Gowon Edoumiekumo, the 4th and immediate past Vice Chancellor of Niger Delta University and Prof. Stanley Ogoun, the Zonal Coordinator of Port Harcourt Zone of ASUU and Dr. Ebi Baraka, the immediate past Vice Chairman of ASUU NDU. The struggle for the development of Niger Delta University brought us together and you worked selflessly, even, with attacks on your persons. Your friendship is highly appreciated. Posterity will recognize your enormous contributions to the development of this University.

And most importantly, the General Officer Commanding (GOC) the home front, the Chief of Staff, my wife and confidant, Mrs. Edith Ebimoboere Kingdom nee Godspower-Orodu, who has endured my neglect and very busy schedules. I appreciate you for the love, patience, sacrifice you have made in this journey we started together about a decade and half ago. I also appreciate my lovely and beautiful children, Dame Dengimoere, Zuobuomoowei (Z-boy) and Powei (Praise-boy), for tolerating my absence.
I will not forget the contributions of my wonderful students, both past and present.

Mr. Vice Chancellor Sir, My Lords, Spiritual and Temporal, Distinguished Ladies and Gentlemen, thank you for the show of love, patience and rapt attention. God bless you the MORE.

Professor Tonbarapagha Kingdom
Inaugural Lecturer
23rd April 2025

NDU 59TH INAUGURAL LECTURER

Prof. Tonbarapagha Kingdom

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ABOUT THE INAUGURAL LECTURER

Professor ó rótonbarapagha Theophilus Kingdom was born at Lokoja, in old Kwara State, into the family of Late Sgt. Kingdom Daniel Barakabo of the Inebiegberigba Dynasty of Polaku Town, Yenagoa Local Government Area and then Mrs. Koridigha Kingdom (nee Mieseigha) of Abuwari Community, Kolokuma/Opokuma Local Government Area, all of Bayelsa State.

He attended Army Children School, Ashanti Barracks, Apapa, Lagos (1978 - 1984) and Tin – can Island High School, Tolu Schools Complex, Lagos (1984 – 1989) where he was the best student in the West African School Certificate Examinations in 1989.

He later read Fisheries Technology and obtained National Diploma at Federal College of Fisheries and Marine Technology, Victoria Island, Lagos between 1991 and 1993. He registered in the same institution for Higher National Diploma (HND) in 1994, but was unfortunately dismissed for students' Union activities in 1996, as the Speaker of Students Representative Council (Students' Parliament). He had a long legal tussle with the institution before he was recalled. But, by that time, he had changed his mind about getting an HND. He had resolved to go for a degree programme.

He therefore proceeded to then Rivers State University of Science and Technology, Port Harcourt, where he graduated with a first-class B.Sc. degree in Fisheries in 2004 and subsequently bagged a Master of Science degree in Fisheries Biology and Management in 2007 from the same institution, with a 5.00 CGPA on a 5-point scale. He obtained a Doctor of Philosophy (Ph.D) in Fisheries and Hydrobiology from the unique University of Port Harcourt in 2012.

CAREER PROGRESSION/CONTRIBUTIONS TO FISHERIES DEVELOPMENT:

Tonbara' was appointed as a Graduate Assistant into the Department of Fisheries, Niger Delta University, Wilberforce Island in 2005 and rose to the rank of Professor in 2020. He was the Departmental Examination Officer from 2012 till March 2023 and was also Faculty Examination Officer between 2016 and 2019.

He was elected in 2016 as Faculty Representative to Senate and a member of two powerful Senate committees: Admission and Graduation Requirements Committee (A & GRC) and Senate Business Committee. He was also a member of University Website Committee, University Quality Assurance Committee, University Research Committee, University Economic Team and presently a

member of University TetFund Education Board and University Budget Monitoring Committee.

He was a Congregation Representative to the Appointment & Promotion Committee (Academic) between 2015 and 2019, and a member of the Governing Council of the University, representing the Congregation, between 2019 and 2021.

He was the Director of Students' Industrial Working Experience Scheme (SIWES) Unit from May 2017 till March 2023, when he was appointed the Deputy Vice Chancellor (Academic) of the University. He is presently, the Deputy Vice Chancellor administration of the University.

Professionally, Prof. Kingdom has been very active. He has been:

- **Editor**, Fisheries Society of Nigeria, Bayelsa Chapter Nov. 2015 – Nov. 2017
- **Assistant National Secretary,** Fisheries Society of Nigeria Nov. 2012- Oct. 2016
- **State Secretary**, Fisheries Society of Nigeria, Bayelsa Chapter Aug. 2006 – Nov. 2015
- **National Vice President (Training and Research)**, Fisheries Society of Nigeria, Oct. 2016 – Oct. 2018

- **Member**, Nigerian Environmental Society

- **Member**, National Shellfisheries Association
- **Member,** World Aquaculture Society (WAS)

- **Secretary,** Local Organizing Committee, 27th Annual National Conference/Biennial General Meeting of Fisheries Society of Nigeria held in Yenagoa, Bayelsa State Nov. 2012
- **National Conference Coordinator, 3**2nd Annual National Conference/Biennial General Meeting of Fisheries Society of Nigeria held in Awka, Anambra State Oct. 2017
- **Technical Assistant**, Erml Fisheries Resettlement Action Plan for Brass Liquefied Natural Gas (Brass LNG) in 2008
- **Supervisor,** World Bank sponsored Fadama III Baseline Survey in Bayelsa State in 2009
- **Consultant**, Fisheries Study of ERML Environmental Evaluation Review of OML 42, Warri South West Local Government Area, Delta State in 2016
- **Project Coordinator**, Maximizing Agricultural Revenue in Key Enterprises and Targeted Sites (MARKETS II) Project, funded by USAID, which trained 3, 000 fish farmers in Edo and

Delta States between September 2015 and July 2017.

HIS NOTABLE ACHIEVEMENTS INCLUDE:

- **Student's Union Government Award for Meritorious Service in Recognition as a Member of Student's Representative Council,** Federal College of Fisheries and Marine Technology, Lagos (1993)
- **Federal Government of Nigeria Scholarship** for Undergraduate Programme in the Rivers State University of Science and Technology, Port Harcourt (2003/2004)
- **Chief Stephen Chukwu–Akwu Award**: Best Graduating Student in Fisheries, Rivers State University of Science and Technology, Port Harcourt (2004)
- **University of Lagos Alumni Association, Port Harcourt Prize:** Best Graduating Student in Agricultural Science, Rivers State University of Science and Technology, Port Harcourt (2004)
- **Deans' Prize:** Best Graduating Student in Faculty of Agriculture, Rivers State University of Science and Technology, Port Harcourt (2004)
- **Fisheries Society of Nigeria's Award of Appreciation** in recognition of commitment and

contribution to the Society and Fisheries Development (2014)

- **The Netherlands Fellowship Programme (NFP)/ Kenninsontwikkelingsprogramma (KOP) Fellowship** to attend an International course on the Ecosystem Approach to Fisheries in the Wageningen Centre for Development Innovation, Netherlands (2018)
- **Fisheries Society of Nigeria's Meritorious Award of Service** as National Vice President, Training and Research (2016-2018) of the Society (2018)
- **Department of Fisheries, Niger Delta University Award of Honour** for Discipline, Knowledge, Skill and Hardwork (2023)
- **Fellowship Award**, Fisheries Society of Nigeria (FISON) (2024)

In unionism, Prof. Tonbara' Kingdom started as a Parliamentarian in the Students' Representative Council at Federal College of Fisheries and Marine Technology, Victoria Island, Lagos in 1993. Later, he became the Speaker in 1996 and rose from being the Financial Secretary/Treasurer and Branch Secretary, to become the Branch Chairperson of Academic Staff Union of University (ASUU) in Niger Delta University in 2019. A position he held until March 2023.

Prof. Kingdom has published widely in local, National and International journals. He has also reviewed for many journals within and outside this country. His research interests cover Fisheries Biology and Management (with major in shell fishes), Fish Environmental Survey and Fishing Gear studies.

He is a Christian and serves as a teacher in the Anglican Children Ministry (ACM), in the Diocese of Northern Izon, Church of Nigeria (Anglican Communion).

His personal life principles include Godliness, contentment, service to God and man.

CONCLUSION:

He is married to Mrs. Edith Ebimoboere Kingdom nee Godspower-Orodu (an Agricultural Economist), a Zonal Extension Manager (ZEM) in Delta State Agricultural and Rural Development Authority (DARDA) and blessed with three beautiful kids, namely, Dame Dengimoere, Zuobomo-owei (Z-boy) and Powei (Praise-boy). His hobbies include cooking, travelling, reading and playing soccer.

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NIGER DELTA UNIVERSITY
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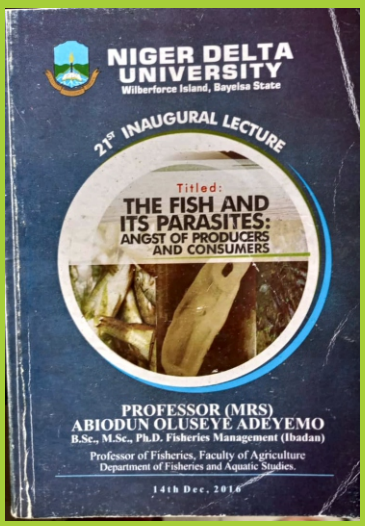
WILBERFORCE ISLAND, BAYELSA STATE.

6th Inaugural Lecture

INSECTS:
Our Friends Our Foes

Prof. Timothy T. Epidi



NIGER DELTA UNIVERSITY
WILBERFORCE ISLAND, BAYELSA STATE.

49th Inaugural Lecture

Musa sapientum and Musa paradisiaca: THE COMPARATIVE BRIDE

BY

PRINCE EBIOWEI KAINGA
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NIGER DELTA UNIVERSITY
WILBERFORCE ISLAND, BAYELSA STATE.

58th Inaugural Lecture

CONGENITAL MALFORMATIONS:
IS IT BY ACCIDENT OR THE GODS ARE TO BLAME?

PROFESSOR ALOYSIUS EBI LIGHA
MBBS(Ibadan), MSc (Lagos), PhD (UPH), MD (UCN), FPCR(Manila)
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