

POLICY BRIEF ON THE JULY 2021 NATIONAL DIALOGUE

“Transformation and Future of Aquatic Food Systems in Nigeria”

SEPTEMBER 2022



Acknowledgements

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Foreword

Ministerial Announcement: Nigeria Developing a Ground-breaking Sustainable Aquaculture Strategy

The challenge of malnutrition remains a major problem for all countries in Africa, including Nigeria. It fundamentally impacts people's health and wellbeing; it keeps people in poverty by affecting their ability to learn and work; and it acts as a brake on economic growth. Against this background, aquaculture represents a massively under-exploited opportunity for the citizens of Nigeria, not just to improve our diets and nutrition but to generate jobs and incomes through the food chain – in production, processing, transport and retail. It is for these reasons, that I instructed my officials to take immediate steps to develop a new national sustainable aquaculture strategy. This will form a key component of Nigeria's contribution to the African Union's announced "Year for Nutrition" and consolidate Nigeria's leadership in this important area.

Aquaculture currently contributes to 30% of total domestic fish production, with the potential to grow three-fold, making Nigeria a self-sufficient and net fish-exporting country. Increasing aquaculture production by an additional 560,000mt would create 2.2 million jobs in Nigeria, and an expansion to women's involvement in the fish value chain as well as producing nutrient-rich fish and fisheries product that would provide vital additional protein in the diet.

Growth in the aquaculture industry have been identified by the Presidential Committee on Fisheries and Aquaculture as a key area for action for fisheries development in the country. The process for developing the new strategy started with an National Dialogue on Transformation and Future of Aquatic Food Systems in Nigeria that was held on the 18th of July 2021, in the build up to the UN Food Systems Summit. Involving leading experts from across Nigeria, this event has identified a wealth of ideas and innovations with the potential to catalyse and energise the aquaculture sector. The most promising of these provided the foundation for the new policy brief.

The Nigerian government has already made commitments to prioritise the sustainable, inclusive development of the national aquaculture sector. With the recent publication of Nigeria Fish Futures it becomes more apparent than ever, the need for a national aquaculture development plan and strategy by the Federal Department of Fisheries and Aquaculture which would form a key component in the country's commitment to the 2022 African Year of Nutrition.

Executive Summary

Current food systems fail to recognise the diversity of aquatic foods and their potential to contribute to sustainable healthy diets and their potential to address the burden of malnutrition¹. Deficiencies in micronutrients lead to one million premature deaths annually, and dietary inadequacies are one of the most pressing reasons for people experiencing multiple nutrient deficiencies and subsequent morbidity and mortality². Aquatic foods can have very considerable potential in helping to fill this nutrient gap and improve diet quality, particularly in sub-Saharan Africa.

This policy brief makes a wide range of practical, realistic and pragmatic game-changing recommendations to address the critical challenges facing the fisheries and aquaculture sector (aquatic food systems) in Nigeria. The brief is an outcome of the National Dialogue on Transformation and Future of Aquatic Food Systems in Nigeria held in Abuja on 8 July, 2021. This dialogue was part of the national programme of activities which contributed to Nigeria's participation in the UN Food Systems Summit (UNFSS).

The production of aquatic foods in Nigeria currently contributes about 30% to total national domestic fish production. However, it has the potential to grow three-fold and transform the country from a net fish importing country to a self-sufficient and fish exporting country, thus earning substantial foreign exchange.

The event in Abuja, The National Dialogue on Transformation

and Future of Aquatic Food Systems in Nigeria, provided an opportunity for the attendees to identify a wide range of potential policy actions to help Nigeria further develop its aquatic food sector, and to realise its very considerable potential.

The 72 recommended policy actions were clustered into five areas: research and infrastructure development; collaboration, partnerships, and investments; fisheries and aquaculture governance; resource conservation, environmental protection, climate change resilience; and sustainable livelihoods and inclusiveness. A subset are shown in Figure 1 with the full list provided in Table 1 at the end of the brief.

There is a great opportunity for the development of a cross-sectoral national strategy for Nigeria to capitalise on the generation of these policy recommendations, providing direction and coherence for the transformation and development of the aquatic food system in the country. Such a strategy would align with the national UNFSS commitments that Nigeria made in September 2021 to transform its food systems.

The strategy would set national goals and objectives to strengthen the aquaculture and fisheries sector, to help eliminate malnutrition and malnourishment, improve livelihoods, eradicate poverty, create competitive value chains, increase fish export earnings and attain the Sustainable Development Goals (SDGs).

Figure 1. Five areas of recommended policy actions





1. Introduction

This policy brief makes a wide range of practical, realistic and pragmatic game-changing recommendations to address the critical challenges facing the fisheries and aquaculture sector (aquatic food systems) in Nigeria. The brief is an outcome of the National Dialogue on Transformation and Future of Aquatic Food Systems in Nigeria held in Abuja on 8 July, 2021. This dialogue was part of the national programme of activities which contributed to Nigeria's participation in the UN Food Systems Summit (UNFSS).

Current food systems fail to recognise the diversity of aquatic foods and their potential to contribute to sustainable healthy diets and their potential to address the burden of malnutrition. Deficiencies in micronutrients lead to one million premature deaths annually and dietary inadequacies are one of the most pressing reasons for people experiencing multiple nutrient deficiencies and subsequent morbidity and mortality. Aquatic

foods can have very considerable potential in helping to fill this nutrient gap and improve diet quality, particularly in sub-Saharan Africa.

Despite the potential contribution of aquatic foods to nutrition security and livelihoods in low- and middle-income countries, they are often overlooked in favour of other food systems policies in Nigeria. Food systems in this brief refer to “the production, marketing, transformation and purchase of food, and the consumer practices, resources and institutions involved in these processes”³.

This brief first provides an overview of the aquatic foods sector in Nigeria, which includes aquaculture as well as the fisheries sector. It then discusses some of the challenges within this sector and finally presents a comprehensive set of recommendations.



2. Background to the aquatic foods sector in Nigeria



The aquatic foods sector in Nigeria has two main components: the domestic production of aquatic foods, and capture fisheries, which comprise artisanal fisheries and industrial fisheries. The focus of this brief and its policy recommendations is on the former.

The production of aquatic foods currently contributes about 30% to total national domestic fish production⁴. However, it has the potential to grow three-fold and transform Nigeria from a net fish importing country to a self-sufficient and fish exporting country, thus earning substantial foreign exchange. In 2014, fisheries contributed 0.48% to Agriculture GDP which in turn contributed 20.24% to total GDP in 2014⁵.

Industrial (capture) fisheries contribute about 7% to national fish production, with export earnings of shellfish and other fishery products currently worth about US\$ 60 million annually. Each sub-sector has the potential for further development, with a view to contributing more to national food and nutrition security.

While the global average for fish consumption is 21 kg per capita per year, that of Nigeria is about 12 kg per capita per year. Nigeria not only 'lags behind the world' in fish consumption but also production, largely because the potential for fish and aquatic food production has not been fully realized. The total fish demand for Nigeria based on the 2014 population estimate of 180 million is 3.32m Mt whereas domestic fish production from aquaculture, artisanal and industrial fisheries for 2014 was 1,027m Mt. Addressing this production challenge would also help address the social and economic challenges of Africa's largest economy and a country of more than 200 million people⁶.

Growth in aquaculture was identified by the Presidential Committee on Fisheries and Aquaculture as a key aspect for fisheries development in Nigeria: a five-year target was thus set for the production of two billion fingerlings, 1.5 million tonnes of fish feed, and one million tonnes of table fish⁷.

Barriers to development of the aquatic foods sector

The aquatic foods sector in Nigeria faces several barriers that must be overcome to further capitalise on the potential benefits of aquatic foods and to enhance the contribution of the sector to the national economy, food and nutrition security, poverty reduction and the Sustainable Development Goals (SDGs). Some of the main constraints, as identified by the Federal Ministry of Agriculture and Rural Development, include:

- lack of key production inputs;
- poor quality feeds;
- use of low productive breeds in aquaculture;
- poor water quality and environmental degradation / pollution;
- low yields due to overfishing;
- huge post-harvest fish losses;
- growing negative impacts of climate change;
- lack of adequate public funding;
- poor fish quality assurance;
- weak research and development linkages;
- growing national insecurity;
- poor infrastructure;
- policy constraints.

While the potential benefits of aquatic foods to food security and nutrition are recognised, government agencies working on food security and nutrition have recently emphasised that aquatic foods are largely absent from national strategies for the reduction of dietary micronutrient deficiencies, precisely where they could potentially have the largest impact⁸.

3. An Overview of the Fisheries Sector in Nigeria

a. Profile of Nigeria's fisheries sector

Nigeria is a maritime country with a coastline of about 853 km in length bordering the Atlantic Ocean. The surface area of its continental shelf is about 37,934 km², while the Exclusive Economic Zone (EEZ) covers an area of about 210,900 km² within which Nigeria exercises sovereign rights for the purpose of exploiting, conserving, and managing its pelagic and demersal fisheries resources. The first five nautical miles from the coastline is reserved for the artisanal canoe operators or 'fisherfolk' and is therefore designated a Non-Trawling Zone, while the Inshore (Territorial) Waters extend to 12 nautical miles from the coastline. The 200 nautical-mile Exclusive Economic Zone (EEZ) provides fisheries resources for industrial/commercial fishing and shrimping vessel operators. There is also an extensive area further inland made up of brackish water, creeks, lagoons and swamps whose waters provide fish and shrimp resources for the fishing communities along their shores.

There are numerous freshwater rivers flowing mainly in the North-South direction, draining through the brackish water distributaries to the sea. These waters also provide fisheries resources for exploitation; in addition, there are numerous ponds and excavated burrow pits for fish production, and innumerable natural and man-made lakes such as Kainji Lake, and other reservoirs and wetlands with considerable potential for fish production. The total inland water surface area of about 14,000,000 hectares is mostly suitable for fish culture to produce more than two million tonnes of fish annually.

The Nigerian fisheries sector can therefore be categorised as shown in figure 2.

Each sub-sector has the potential for further development, with a view to contributing more to national food and nutrition security.

Figure 2. Breakdown of the Nigerian fisheries sector

1 Aquaculture (Fish Culture / Farming)

- The culture of fish in a controlled environment.
- This sector contributes about 30% to total domestic fish production.

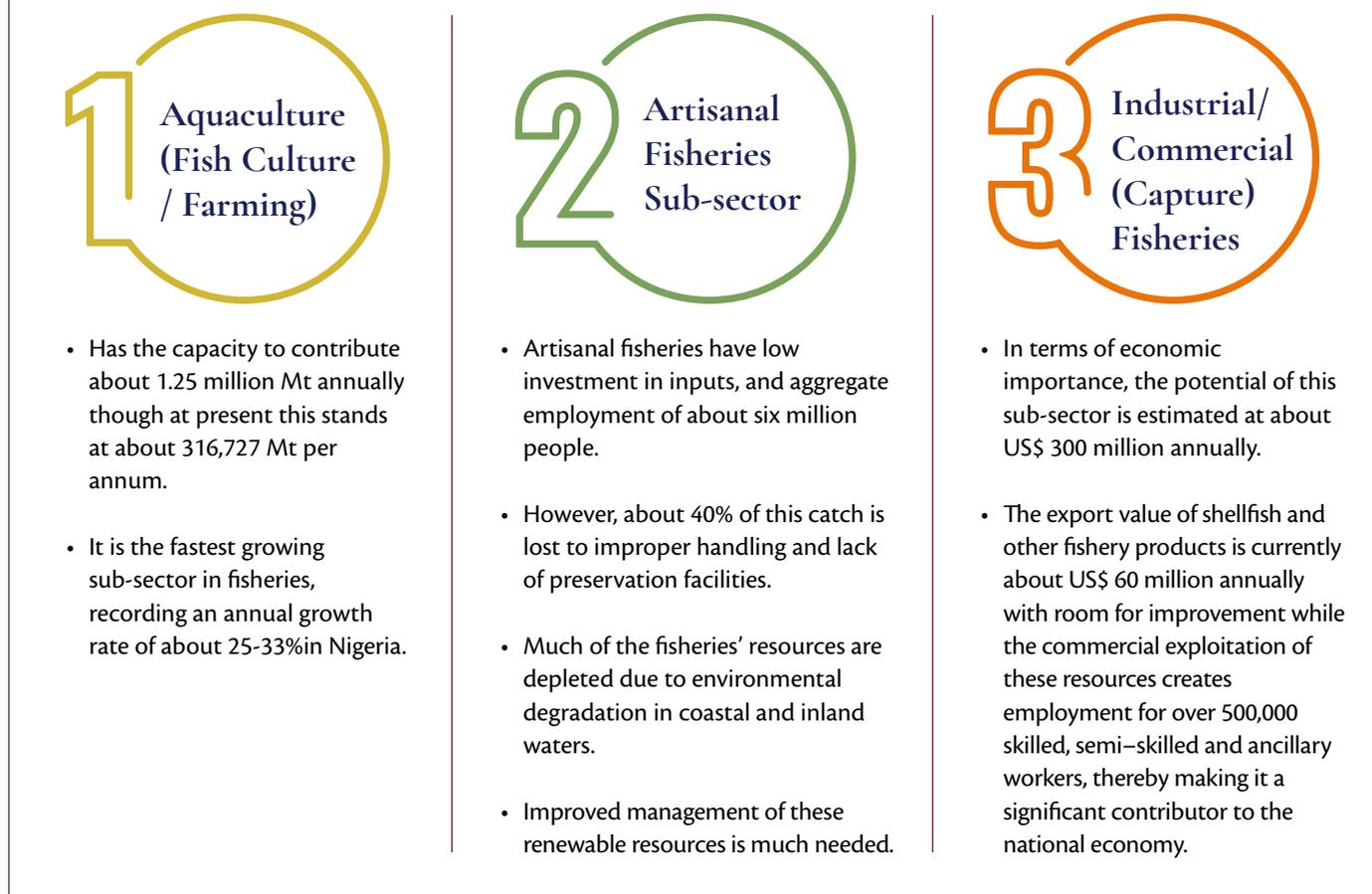
2 Artisanal Fisheries Sub-sector

- Dominated by small-scale (motorised / non-motorised) canoe operators and mainly confined to remote coastal and inland fishing areas of Nigeria.
- The sector contributes about 80% – 90% of total domestic fish production in the country. The peculiarities of artisanal fisheries in Nigeria limit the enforcement of inland fisheries laws and regulations. The fisherfolk are widely dispersed and migrant in nature; many fishing villages are remotely located and not readily accessible, while the fishing gear is complex and varied in nature.

3 Industrial/ Commercial (Capture) Fisheries

- Employs the use of sophisticated vessels and equipment for ease of access to the coastal marine fisheries resources.
- The fishing method adopted is mainly trawling, targeted at various species of finfishes and shellfishes.
- Contributes about 7% of domestic fish production.
- It is capital intensive.

Figure 3. Contribution of the fisheries sector to Nigeria's potential for self-sufficient fish production



Nigeria requires about 3.5 million metric tonnes of fish annually to satisfy the food and dietary requirements of its 190 million plus citizensⁱ. Unfortunately, the total domestic fish supply from all sources (capture and culture) is only about 1,027 million metric tonnes per annum. To augment the shortfall, Nigeria has to import a large quantity of frozen fish, making it the largest importer of fish in Africa. However, Nigeria has the potential to be self-sufficient in fish production. This can be realised in a variety of ways, shown in Figure 3.

b. Fisheries Regulatory Instruments

The Sea Fisheries Decree of 1971, which was later reviewed to become the Sea Fisheries Decree No. 71 of 1992, is an instrument exercised by the Federal Department of Fisheries in its marine fisheries governance efforts. The legislative instrument covers fisheries activities in Nigeria's Territorial Waters and Exclusive Economic Zone, and makes provision for the governance of all aspects of Nigeria's marine fisheries sub-sector including Fishing and Licensing regulations. The Sea Fisheries Act was reviewed and updated recently through the support of the European Union-ACP Fish II Project. The Sea Fisheries Act 2014 is a law designed to regulate the exploration and exploitation of fisheries in Nigerian coastal marine waters for the purpose of fisheries conservation, preservation and management with a view to promoting the country's economic development and fishery products for human consumption.

c. Other Relevant Policy Documentsⁱⁱ

i. Nigeria Agricultural Promotion Policy – 2016-2020 (The Green Alternative)

ii. Agricultural Sector Food Security and Nutrition Strategy (2016-2025)

d. Ongoing Collaboration and Partnership Programmesⁱⁱⁱ

In order to attain its national goals and objectives in the attainment of food and nutrition security, Nigeria is in partnership with a few regional and international organizations. The following are ongoing projects being implemented in Nigeria in collaboration with such organizations:

- Worldfish Nigeria Research Programme
- FAO-CECAF-PESCAO Project
- FAO Fish for ACP Project
- Relationship with Iceland in the Field of Fisheries / United Nations University Fisheries Training Programme
- Enhancing Capacity/Risk Reduction of Emerging Tilapia Lake Virus (TiLV) to African Tilapia Aquaculture (FAO/ASTF TiLV)

i Please see Annex 1 for a summary of Nigerian fisheries data

ii Please see Annex 2 for details.

iii Please see Annex 3 for details.

4. Challenges facing the fisheries and aquaculture sector (aquatic food systems)

There are numerous challenges facing the sub-sectors of the fisheries and aquaculture sector (aquatic food systems) in Nigeria. Within the aquaculture sector, there are specific pricing and financial challenges related to the high costs of inputs (notably construction equipment and quality fish seeds). Some inadequacies exist: in the supply of quality fish feed, in the facilities for genetic improvement, and in a shortage of technical experts in the field.

Several of the challenges in artisanal fisheries relate to its impact on the environment and ecosystems – by causing the

destruction of fish breeding grounds, producing pollution, weed infestation, and inland and coastal erosion. The sustainability of these fisheries is also a challenge due to over-fishing.

Industrial (marine) fisheries face legal and regulatory challenges, given the high rates of illegal, unreported and unregulated fishing that occurs in Nigeria's marine waters, especially by foreign vessels. There is an urgent need for effective fisheries Monitoring, Control and Surveillance (MCS).

5. Recommended policy actions to manage aquatic food systems challenges

The National Dialogue - Transformation and Future of Aquatic Food Systems in Nigeria provided an opportunity for the attendees to identify a substantial number of possible policy actions to help Nigeria further develop its aquatic food sector, and to realise its potential. The 72 recommended policy actions were clustered into five areas set out in Figure 4 on the next page.

The range and diversity of these is a reflection both of the importance in which the attendees held the sector,

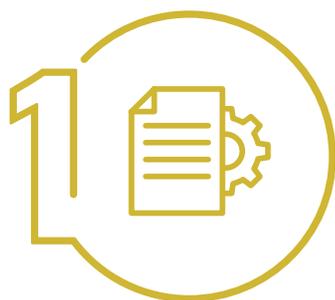
and of the scope for diverse stakeholders to do more to capitalise on the opportunities offered. While it may not be feasible to implement all of these immediately, this list provides a substantial resource of ideas and advice to help policy makers act in accordance with their individual policy priorities. It also offers many ideas for actions that could be integrated into existing policy strategies to create multiple positive impacts.

6. Conclusion

The implementation of the recommendations above should be driven by the Government (Federal/State/Local Government Ministries/Departments/Agencies) in collaboration with the private sector and Non-Governmental Organisations in Nigeria. In addition, there is the need for deeper collaborations and partnerships with local, regional and international agencies and organisations in order to transform and develop the aquatic foods system in Nigeria. Nigeria should exploit the Africa Development Bank's Feed Africa Strategy and other initiatives in the implementation of the policy actions recommended at the National Dialogue to address existing challenges, and attain the set national goals and objectives of eliminating malnutrition and malnourishment, improving livelihoods, eradicating poverty, creating competitive value chains and increasing fish export earnings.



Figure 4: Five areas of recommended policy actions^{iv}



Strengthen research and infrastructure development

- Research and development of alternative culture fish species
- Development of new fish product and processing technology
- Production and supply of adequate quality breeder seed
- Research on alternative sources of feed ingredients and on reduction in cost
- Research on under exploited fishery resources



Foster collaborations, partnerships, and investments

- Establishment of an integrated Aquaculture Market Information System (AMIS)
- Harmonisation of fisheries and aquaculture research and curricula in University and Research Institutes nationally
- Bridging gap between government agencies, private sector and research
- Promotion of private sector participation and investment



Improve fisheries and aquaculture governance

- Effective interaction with other stakeholders in the management of water bodies and the implementation of development programmes to engender greater inclusiveness
- Enforcement of laws to preserve aquatic resources
- Establishment of self-sustained institutions to implement fisheries laws and regulations



Prioritise sustainable livelihoods and inclusiveness

- Improvement of livelihoods in rural communities through improved access to high-quality education and access to basic needs
- Ensuring the welfare of fishermen and fish farming communities
- Empowerment of women and youth in fisheries and aquaculture value chain activities



Build environmental protection, resource conservation and climate change resilience

- Reduction of biodiversity loss, pollution, water use, soil degradation and GHG emissions
- Conservation of water use and fisheries resources
- Mitigating the impacts of climate change
- Building climate resilience in areas prone to conflict or natural disasters

^{iv} See Table 1 for the full list of recommendations

TABLE 1

Recommended Policy Actions to Manage Aquatic Food Systems



Strengthen research and infrastructure development



Foster collaborations, partnerships, and investments



Improve fisheries and aquaculture governance



Prioritise sustainable livelihoods and inclusiveness



Build environmental protection, resource conservation and climate change resilience



Strengthen research and infrastructure development



- Intensive research into new suitable aquaculture candidates locally and/or importation of brood fish intentionally for diversification of cultured species and associated product development e.g. Fish oil, Fish paste
- Establishment of an Integrated Aquaculture Market Information System (AMIS)
- Intensive research by universities and research institutes (with increased funding by government, the private sector and donor agencies) in the production and supply of
 - adequate quality breeder seed;
 - alternative culture fish species;
 - reduction in cost of quality feed -alternative sources of feed ingredients;
 - new processing technology with high food safety and production standards.
- Review and harmonisation of fisheries and aquaculture research and academic curricula in universities and research institutes nationwide to address the needs of the industry.
- Development and expansion of access roads, the electricity network, adequate market structures and a modern transportation system.
- Aquaculture mapping of flood plains, dams and unexploited abandoned mining sites.
- Development of comprehensive packages for brood stock development, hatchery operations and local feed development.
- Improvement of market infrastructure and post-harvest facilities to create a functional supply chain system.
- Preparation of a comprehensive rescue plan for fin/shellfishes to facilitate increased local and international trade.
- Construction of modern fish markets to improve fish trade and incomes.
- Timely dissemination of research findings to government agencies and the private sector in order to expand research into new areas and unexploited fishery resources, and bridge existing linkage gaps.
- Introduction of new suitable indigenous candidate fish species for aquaculture.
- Sustained research and modelling effort on pollutant pathways and the links between pollution causes and effects along with an effective monitoring of water quality.





Foster collaborations, partnerships, and investments



- Capacity building & training along the entire fisheries and aquaculture value chain, including on the requirements for the export of fisheries and aquaculture products.
- Engagement of the service of aquaculture and fisheries experts by commercial banks in Nigeria to facilitate easier disbursement of loans by the private sector.
- Adequate funding of the fisheries and aquaculture sector through increased budgetary allocations for regulatory and research bodies in the sector.
- Establishment of a Technical / Scientific Committee within the Federal Ministry of Agriculture and Rural Development (FMARD), Federal Department of Fisheries (FDF) structure in collaboration with Agricultural Research Council Of Nigeria (ARCN), National Agricultural Extension and Research Liaison (NAERLS) and Fisheries Society of Nigeria (FISON) to enhance the availability of investment information and regulatory protocols for the fisheries and aquaculture sector. The Committee will consist of invited scientists, investment experts, and planners to glean investment opportunities in the fisheries sector based on the findings of research institutes and universities.
- Development of an effective Information or Data Collection System, Inputs Certification and establishment of Best Management Practices.
- Establishment of greater synergy and cooperation with other government agencies and international organisations in monitoring fishing and related activities in the country's water bodies.
- Creation of awareness/advocacy on current and emerging Anti-Microbial Use (AMU)/ Anti-Microbial Use (AMR) hazards to foster antimicrobial stewardship with capacity building in fish inspection/certification.
- Establishment of an effective linkage of fishing communities around water bodies to markets through the provision of appropriate infrastructure eg. roads and power, especially renewable energy to reduce post-harvest losses and enhance preservation of fish.
- Effective stakeholder consultation in the development of fisheries and other projects near water bodies, e.g. dams and irrigation infrastructure.
- Updating of the laws governing the fisheries and aquaculture sector in tune with current global realities and technological advances to enhance greater investments in the sector. The Fisheries Act 2014 sponsored by the European Commission could be a starting point.



Improve fisheries and aquaculture governance



- Promotion of good governance in the fisheries and aquaculture sector through effective interaction (dialogue) with other stakeholders in the management of water bodies and the implementation of development programmes in order to engender greater inclusiveness.
- Clear definition of the ownership of water bodies and the roles of various stakeholders to avoid potential conflicts in water use.
- Indiscriminate use of underground water for fish farming needs to be particularly controlled to avoid depleting aquifers.
- Establishment of all-inclusive stakeholders' innovation platforms on fisheries and aquaculture development.
- Determination and protection of the water needs and requirements of user groups to avoid conflicts, especially between fisherfolk and other critical stakeholders.
- Review and institutionalisation of the laws governing water use and traditional ownership of water bodies to mitigate pollution, overuse and conflict of interests.
- Establishment of a self-sustaining institution: the Nigeria Fisheries Commission, as outlined in the Fisheries Act, 2014, to implement the updated and enacted fisheries laws and regulations.
- Legislative action on the establishment of a 'Fisheries Dedicated Fund' to speed up fisheries development and overcome the recurring issue of inadequate budgeting for the fisheries sector and to stimulate economic growth.
- Enforcement of relevant laws to preserve aquatic resources and the application of a Polluter-Pays-Principle.
- Indiscriminate use of underground water for fish farming needs to be particularly controlled to avoid depleting aquifers.



Prioritise sustainable livelihoods and inclusiveness



- Introduction of a Fishers-first-Policy on water use in water bodies as fisher folk are usually the first occupants and users, followed by livestock farmers, irrigation farmers and finally water supplies to semi-urban and urban towns.
- Recognition and prioritisation of the nutritional contribution of fish and its priority in the food systems of Nigeria. The political relevance of fishers should be raised.
- Identification and prioritisation of high fish production areas in the provision of infrastructure in the rural development policy of Nigeria.
- Institutionalisation of a compensation or de-risking process to engender investment in the fisheries and aquaculture sector.
- Inclusion of fisher folk operations (artisanal fisheries) in the CBN Anchor Borrowers Programme along with fish farm operations (aquaculture).
- Improvement of livelihoods in rural communities through improved access to high-quality education (inclusion of fisheries as a subject in secondary school curriculum) and better access to basic and facilitating infrastructures and amenities such as schools, markets, rural electrification and health facilities.
- Empowerment of women and youth in fisheries and aquaculture value chain activities.
- Promotion of gender-friendly adaptive technologies.
- Facilitation of more secure access to financial resources for stakeholders.
- Establishment of Cooperative Groups and Societies for fisheries and aquaculture value chain actors to increase their visibility and enhance their marketing capability.
- Creation of conflict management mechanisms to prevent and resolve conflicts, related to the use of water bodies among different interest groups, especially at the community level.
- Development of entrepreneurial opportunities and capacity building across the fisheries and aquaculture value chains.
- Protection of smallholder fish producers against exploitation by middlemen and market instability (demand, supply and price indices).
- Development of policies and an institutional environment that support multiple livelihood strategies and promote equitable access to competitive markets for fish products and a more supportive and cohesive social environment.
- Enlightenment campaign with relevant information on better nutrition and healthy living in rural fisheries / fishing communities.
- Value addition for enhanced nutrition and markets, especially the production of fish recipes for the school feeding programme, prison feeding, hospitals, IDPs and for other refugees.
- Rehabilitation of displaced fisherfolk and fish farmers for alternative livelihoods.
- Incorporation of smallholders into health insurance and fish business insurance schemes for underwriting of shocks and hazards common in their business operations.
- Equitable protection of artisanal fisherfolk in their activities from sea pirates, poachers, irresponsible trawler operations and environmental pollution.
- Promotion of homestead fish culture to offset losses due to insecurity in farm land and fishing grounds.
- Introduction of improved fisheries technologies suitable for smallholders across the fisheries and aquaculture value chains.
- Introduction of good quality and affordable fish feeds to smallholder aquaculture producers.

Build environmental protection, resource conservation and climate change resilience



- Reduction of food losses and waste in order to bring food-production needs closer to actual food demand, and to minimise the waste of resources and associated environmental impacts.
- Promotion of the use of 4-stroke engines instead of 2-stroke engines in order to reduce the pollution of water bodies and their environment for sustainable fisheries.
- Development and implementation of a national strategy to regulate the discharge of pollutants (wastes and effluents) from fish farms, industries and agricultural lands to protect water bodies and restore already-affected water bodies.
- Review and update policy documents and environmental laws in line with global acceptable practices.
- Reorientation and training of fish farmers on fish production techniques with low environmental food prints.
- Promotion of responsible and sustainable aquatic food consumption in Nigeria with a smaller environmental footprint.
- Implementation of an advocacy / awareness campaign on the viability of reservoir aquaculture.
- Promotion of innovations in the utilisation of fisheries by-products (fish wastes and parts) plus zero waste option in the utilisation of fisheries resources.
- Development of a national strategy for full utilisation of fisheries resources to generate more food options and to provide raw materials for industry, thus enhancing livelihood options for the stakeholders in the industry.
- Sustainable management of the environment through more secure access to and better management of natural resources.
- Increased advocacy and formulation of policy towards the sustainable utilisation of fisheries resources that would ensure zero waste generation.
- Promotion of climate smart aquaculture and fisheries practices for resilience.
- Provision of needed support for a Climate Smart Fish Production System in Nigeria.
- Development of a National Adaptation Plan (NAP) to identify key risks and actions to increase the resilience of food systems.
- Establishment of an early warning system on the impact of climate change to provide real-time information on weather forecasts, flood prediction, and areas likely to be affected especially those used for fish production, and artisanal fisheries.
- Relocation of fishers' settlements and aquaculture farms on water ways to safer areas to avoid loss of lives and investments.



Annex 1 – Nigerian Fisheries Data (Summary):

Length of Coastline	853km	Total Annual Fish Deficit	2.4m tonnes
Surface Area of Continental Shelf	37,934 km ²	Total Fish import (2016)	410k tonnes
Exclusive Economic Zone	210,900 km ²	Annual Aquaculture Potentials	2.5m tonnes
Total Inland Water Surface Area	14m Hectares	Per Caput Fish Intake	17.5kg person/year
Total Annual Fish Demand	3.5m tonnes	Contribution of Agriculture to National GDP	40%
Total Annual Domestic Fish Production (All sources)	1,027m tonnes	Contribution of Fisheries to GDP	4.5%
Total Annual Artisanal Fish Production	759,828 tonnes	Estimated Employment in the Primary Sector	8.5m Jobs
Total Annual Aquaculture Production	316,727 Mt	Estimated Employment in the Secondary Sector	18m Jobs

Annex 2 – Other Relevant Policy Documents

i. Nigeria Agricultural Promotion Policy – 2016-2020 (The Green Alternative):

In order to address the various challenges in the agricultural sector, the Nigerian Government put in place the Agricultural Promotion Policy (2016-2020) document otherwise called the Green Alternative. This was done with a view to driving the economy to focus on non-oil sectors, with agriculture in the lead. The major policy thrust of the initiative was to reduce food imports into Nigeria significantly and increase foreign exchange earnings from agricultural production. The overall goal was to diversify the economy for increased job and wealth creation.

Nigeria is currently the largest producer of catfish in Africa. Catfish accounts for 80% of all fish produced in Nigeria while Tilapia and other fish species contribute the remaining 20%. Nigeria also has over 200 indigenous fish species which can be domesticated and grown through aquaculture. The newly identified potential species for aquaculture are *Gymnarchus niloticus*, *Lates niloticus* (Nile / Niger Perch), freshwater shrimps (*Macrobranchium* species) and lobsters, freshwater mussels, *Cyprinus carpio*, and *Heterotis* species. It is in this area that the Federal Department of Fisheries and Aquaculture has promoted the cultivation of other fish species. The activities of the Department are therefore aimed at meeting the objectives of the Green Alternative document.

The Green Alternative policy enumerated some of the challenges limiting the growth and development of agriculture in Nigeria, including the fisheries and aquaculture sector. These include policy instability; inadequate political commitment; failure of the National Agricultural Research System to generate and commercialise new agricultural technologies to meet national needs and the production of improved seed and breeds of aquatic species; infrastructure deficit; poor access to financial services, funds and market information. The focus of the Green Alternative was on four areas: food security, import substitution, job creation and economic diversification. Some of the innovations in the policy include treating food as a human right, factoring climate change and environmental sustainability, establishing market linkages, and promoting broad stakeholder participation and inclusiveness.

ii. Agricultural Sector Food Security and Nutrition Strategy (2016-2025):

The Agricultural Sector Food Security and Nutrition Strategy (2016-2025) calls for the integration of nutrition into agricultural value chains at multiple levels: production, processing / preservation, markets, and at the household level. It places great emphasis on post-harvest loss reduction for improved nutrition.



Annex 3 – Ongoing Collaboration and Partnership Programmes

i) Worldfish Nigeria Research Programme

WorldFish, headquartered in Malaysia, has established its presence in Nigeria by commencing a WorldFish Nigeria Programme which entails both research development and other developmental programmes.

ii) FAO-CECAF-PESCAO Project

The Fishery Committee for the Eastern Central Atlantic (CECAF) is a consultative body under Article VI of the Food and Agriculture Organization Constitution. The body generates scientific advice and specific recommendations for research and management for selected transboundary demersal and small pelagic fish as well as for small scale fisheries in the CECAF region. With the support of the ongoing CECAF-PESCAO project and the EAF-Nansen Programme, a consultancy project has been designed to identify the challenges hindering the integration of the CECAF management advice into the management processes of selected CECAF Member Countries and to propose mitigation measures through national case studies. Nigeria has been selected as one of the case studies.

iii) FAO Fish for ACP Project

FISH4ACP is an initiative of the African, Caribbean and Pacific States (ACPS), contributing to food and nutrition security, economic prosperity and job creation by ensuring the economic, social and environmental sustainability of fisheries and aquaculture value chains in Africa, the Caribbean and the Pacific. The FISH4ACP sustainable food value chain project is implemented through FAO with funding from the European Union. Presently, the programme is supporting Nigeria's efforts to boost aquaculture production. The project is a five-year programme from 2020 to 2024. Its target beneficiaries are youth and women.

iv) Relationship with Iceland in the Field of Fisheries / United Nations University Fisheries Training Programme

The Federal Department of Fisheries is collaborating with the Icelandic Government through the United Nations University Fisheries Training Programme (now UNESCO-FTP) on research and capacity development of the fisheries and aquaculture sector.

The implementation has commenced with research and surveys to identify the key challenges facing the aquaculture sub-sector in the areas of feed quality, seed quality and the overall profitability of the aquaculture business. A pilot study was carried out in 2019 with significant preliminary findings. The outcome of the pilot study carried out in selected states however necessitated the upscale of the study for a nationally relevant outcome. The project hopes to strengthen the research system of Nigeria and provide information which would assist government in providing relevant policy and programmes that would address the identified challenges in the aquaculture sector.

v) Enhancing Capacity/Risk Reduction of Emerging Tilapia Lake Virus (TiLV) to African Tilapia Aquaculture (FAO/ASTF TiLV)

This is a technical assistance project of the Food and Agriculture Organization (FAO) of the United Nations to Nigeria. Tilapia is an affordable source of protein for many millions of people worldwide, and losses in production, due to epizootic-level disease outbreaks, could be disastrous to global food security and nutrition. Capacity building is therefore essential to assist tilapia-producing countries including Nigeria (competent authorities, producers and academic sectors) to enhance biosecurity governance and knowledge to deal with TiLV and particularly on TiLV pathology, diagnostics, surveillance, emergency preparedness and contingency plans, farm-level biosecurity and good tilapia husbandry services. The programme has commenced in Nigeria with the training of official representatives, while national training for tilapia farmers is expected to commence soon.

vi) The GloLitter Partnership Project (IMO/FAO)

This is an ongoing partnership programme being implemented by the International Maritime Organization (IMO) in partnership with the FAO with funding from Norway (NORAD). The project seeks to assist developing countries reduce and prevent marine plastic litters (MPL) and in particular sea based marine plastic litters SBMPL from entering the marine ecosystem. The project has an implementation period of 2021-2024 and Nigeria is one of the Lead Partnering countries in Africa.

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