

BUILDING RESILIENCE AND NUTRITION SECURITY THROUGH PANGASIOUS CATFISH PRODUCTION

Presented By:

ABEL J. LAKYAM

Head, Programs & Projects

ASSOCIATION OF NORTHERN AGRICULTURAL AND

ALLIED COMMODITIES PRACTITIONERS

Email: abelakyam@gmail.com

Phone/WhatsApp: +234 706 786 5885

Presented To:

**WorldFish Nigeria Aquaculture Dialogue
“Pitch Your Business Concept”**

**7th and 8th May 2024 at the IITA Campus,
Ibadan, Oyo State, Nigeria**

OUTLINE OF PRESENTATION

- 1. Concept Of Food System Resilience**
- 2. Concept Of Nutrition Security Protein Deficiency In Nigeria**
- 3. Demand and Supply of Fish in Nigeria**
- 4. Pangasius: Stocking Density and Yield (Industry Standard)**
- 5. Proposed Production Model**
- 6. Economics of Production of Pangasius Catfish**
- 7. Ten Cycles Production Projection**
- 8. Strategic Plans & Projections**
- 9. Proposed Production Cycle**
- 10. Value Proposition**
- 11. Appendix: Economics Of Production and ROI**

Concept Of Food System Resilience

New shocks and long-term stressors have exerted pressure on food systems, necessitating an improved understanding of how food systems might successfully deal with such adversity.

The capacity over time of a food system and its units at multiple levels, to provide sufficient, appropriate and accessible food to all, in the face of various and even unforeseen disturbances

Thus, Resilience is the process or state of withstanding stress and recovering from it after a disturbance.

Concept Of Nutrition Security Protein Deficiency In Nigeria

- Nutrition security means consistent access, availability, and affordability of foods and beverages that promote well-being, prevent disease, and, if needed, treat disease, particularly among lower income, and rural and remote populations including Tribal communities and Insular areas.
- Whereas Food security is defined as the availability and the access of food to all people; nutrition security demands the intake of a wide range of foods which provides the essential needed nutrients.

PROTEIN DEFICIENCY

According to a survey carried out in 2020 to assess protein deficiency in Nigeria, a total of 92.7 million Nigerians (representing about 45 percent of the population) do not eat any protein in a day, as against recommended consumption.

Demand and Supply of Fish in Nigeria

- Fish makes up over 40% of Nigeria's protein intake.
- The per capita fish consumption in Nigeria is 13.3 kg per year, while the world's average is around 21 kg/year ([WorldFish, 2021](#)).
- Nigeria's annual fish demand is 2.1 million metric tonnes, but able to produce only 1.2 million metric tonnes from both capture fisheries and aquaculture.
- The deficit is being supplemented by fish imports (about 45% of its net domestic fish supply), costing about 1.2 billion USD annually which depletes Nigeria's forex.

Source: 1. <https://digitalarchive.worldfishcenter.org/bitstream/handle/20.500.12348/4951/62fb904f473578437cc01022f3595031.pdf?sequence2=>

2. <https://www.fao.org/3/cb4127en/cb4127en.pdf>

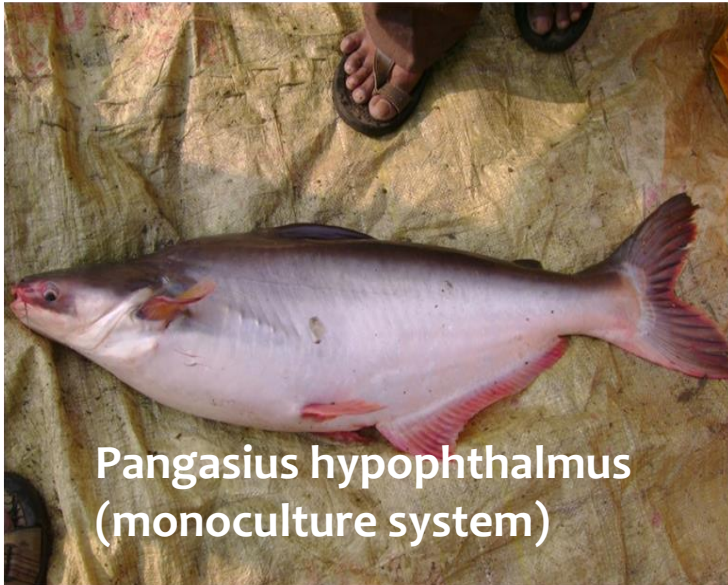
Pangasius: Stocking Density and Yield (Industry Standard)



Production system	Stocking Density	Yield
Open Ponds	60 – 80 fish/m²	250 – 300 Tons/hectare
Cages	100 – 150 fish/m³	100 - 120 Kg/m³
BioFloc	10 -35 fish/m³	10 - 30 Kg/m³
RAS	90 -170 fish/m³	80 - 150 Kg/m³

Proposed Production Model

The model shall promote both monoculture and Polyculture of Pangasius with tilapia and common carp, thus:



Economics of Production of Pangasius Catfish: (model for small & marginal farmers)

Category	Component	Unit	Unit/Costs (₦)
Input Costs	Target production (per crop of 6-months)	Tons	10
	Av. Fish size at harvest	Kg	1.0
	Av. Survival expected	%	90
	No. of fingerlings to stock	Nos.	11,000
	Seed cost (@N60/seed)	₦	660,000
	Total feed required @1:1 FCR	Tons	10,000
	Av. Feed price	N/kg	960
	Feed Cost	₦	9,600,000
	Other Costs @1500/kg (power, additives, labor etc)	₦	15,000,000
	Total Input Costs	₦	25,260,000
Expected Revenue	Av. Selling price of fish	₦/kg	4,400
	Total revenue	₦	43,560,000
	Gross profit (before depreciation & bank interest)	₦	18,300,000
	Profit %	%	42

TEN CYCLES PRODUCTION PROJECTION

Category	Component	Unit	1ST-5TH YEAR	6TH YEAR	7TH YEAR	8TH YEAR	9TH YEAR	10TH YEAR
Input costs	Target production (per crop of 6-months)	Tons	100	150	200	250	300	350
	Av. fish size at harvest	Kg	1	1	1	1	1	1
	Av. survival expected	%	90	90	90	90	90	90
	No. of fingerlings to stock	Nos	110,000	165,000	220,000	275,000	330,000	385,000
	Seed cost (@₦60/seed)	₦	6,600,000	9,900,000	13,200,000	16,500,000	19,800,000	23,100,000
	Total feed required @1.1 Feed Conversion Ratio (FCR)	Kgs	110,000	165,000	220,000	275,000	330,000	385,000
	Av. Feed price	₦/kg	860	860	860	860	860	860
	Feed cost	₦	94,600,000	141,900,000	189,200,000	236,500,000	283,800,000	331,100,000
	Other costs (additives, power, salary etc @₦1500/kg)	₦	150,000,000	225,000,000	300,000,000	375,000,000	450,000,000	525,000,000
	Total input costs	₦	251,200,000	376,800,000	502,400,000	628,000,000	753,600,000	879,200,000
Expected revenue	Av. selling price of fish	₦/kg	4,400	4,400	4,400	4,400	4,400	4,400
	Total sales	₦	435,600,000	653,400,000	871,200,000	1,089,000,000	1,306,800,000	1,524,600,000
	Gross profit (over production cost)	₦	184,400,000	276,600,000	368,800,000	461,000,000	553,200,000	645,400,000
	Profit %	%	42.3	42	42	42	42	42

Strategic Plan & Projections

SHORT TERM

- Target existing aquaculture farmers in Adamawa State
- Profile beneficiary farmers for participation in the scheme
- Distribute inputs (fingerlings, feeds, medication, etc)
- Stay embedded to farmers through extension agents for hand-holding
- Offtake harvest
- Provide post-harvest handling facility (cold storage) and value addition
- Capacity building for the Value chain actors
- Logistic support for linkage to market(local, regional, national, etc

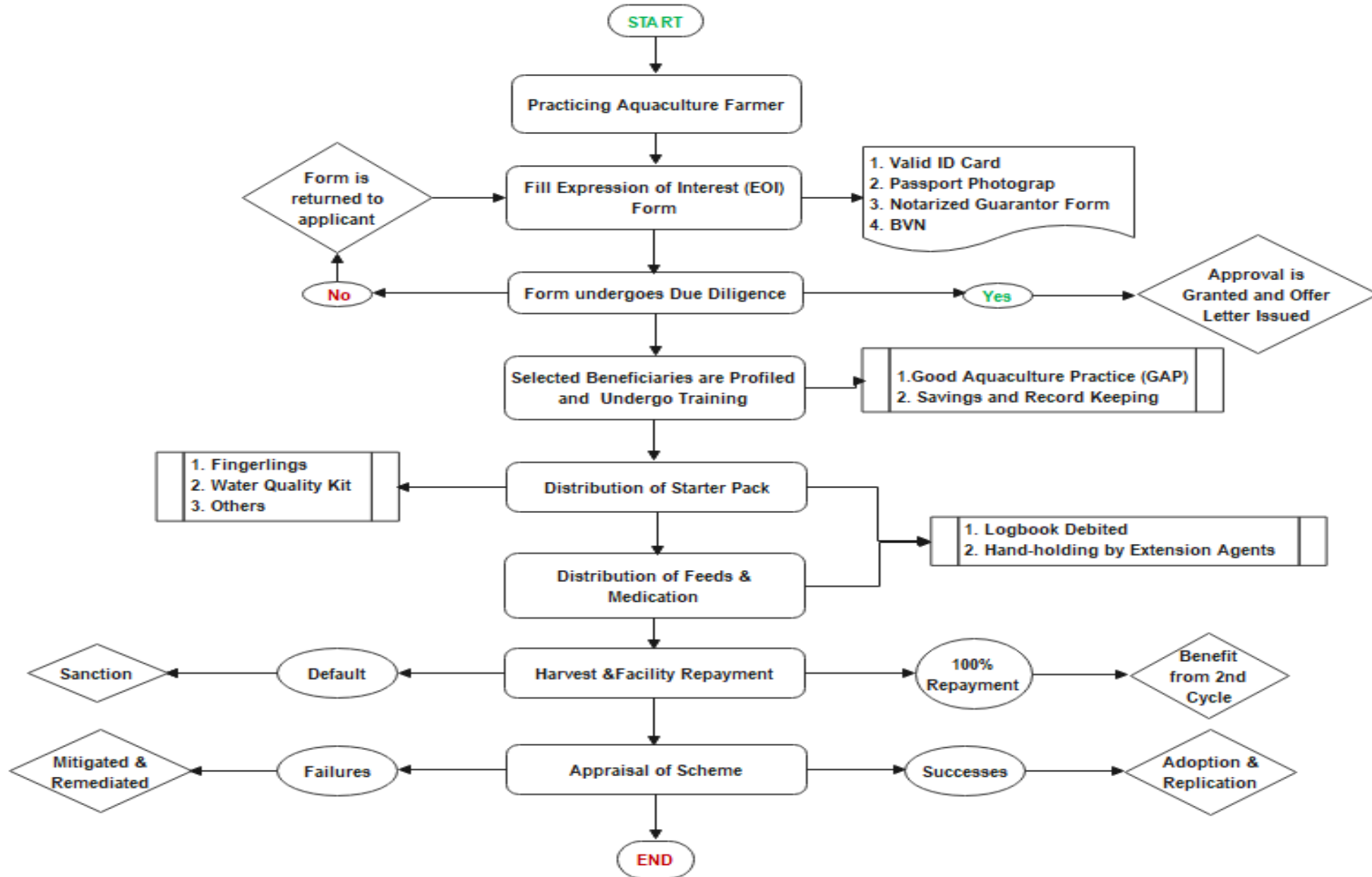
MID TERM

- Replicate Adamawa Model in the five other states in the Northeast (Bauchi, Borno, Gombe, Taraba & Yobe)
- Facilitate the Establishment of a Regional Fish Market
- Establish Post Harvest Processing Facility in areas of comparative advantage to the growth of the Fish business and it's value chain.
- Offtake harvest
- Logistic support for linkage to market(local, regional, national, etc

LONG TERM

- Facilitate the Establishment of Fish Market for Inland (Abuja) and Coastal (Lagos) Areas
- Logistic Support for Intercity linkages
- Establish a standard processing Facility I Lagos and Abuja for Exports
- To cut down on fish import by 80% over a ten years period

Proposed Production Cycle



Value Proposition

- In the context of Nigeria importing fish to fill the gap of shortfall, local fish production must increase to meet the fish demand of its population; diversification into viable species such as Pangasius is an economically viable option
- Pangasius can be regarded as one of the better species for diversification suitable for Nigerian agro-climatic conditions.
- Since Pangasius has already been demonstrated as a much appreciated fish by the Nigerian farmers, it is recommended to re-confirm its potentiality by commercializing its farming in the country.
- It is recommended to establish model farms by importing Pangasius seeds from a reputable source and improve the technical competences of participating farmers.
- Deliberate attempt to promote the adaption of bespoke solutions to production and value addition challenges of the fisheries food system so as to create wealth and food and nutrition security.
- Facilitate the use proven innovative technologies to improve fish and aquaculture systems, resilience, fight poverty and ensure food and nutrition security for the vast population
- To enhance improvement of infrastructure and fish-based raw materials for rapid development of the fish industry and create more employment.



THANK YOU

Appendix: Economics Of Production and ROI

YEAR	INVESTMENT	REVENUE	GROSS PROFIT	NET PROFIT	PRODUCTION	ROI (%)	REMARKS
	₦	₦	₦ (EBTDA)*	₦ (EATDA)**@15%	CYCLE***		
1	251,200,000	435,600,000	184,400,000	156,740,000	1	62.4	One-off investment
1	-	435,600,000	184,400,000	156,740,000	2	124.8	Break even
2	-	435,600,000	184,400,000	156,740,000	3	187.2	
2	-	435,600,000	184,400,000	156,740,000	4	249.6	
3	-	435,600,000	184,400,000	156,740,000	5	312.0	
3	-	653,400,000	276,600,000	235,110,000	6	374.4	
4	-	980,100,000	368,800,000	313,480,000	7	436.8	
4	-	1,470,150,000	461,000,000	391,850,000	8	499.2	
5	-	2,205,225,000	553,200,000	470,220,000	9	561.6	50% increment per cycle after 5th cycle, subsequent investment for
5	-	3,307,837,500	645,400,000	548,590,000	10	624.0	upscaling shall be from equity

*Earnings before taxes, deductions and amortisation

**Earnings after taxes, deductions and amortisation

*** A PRODUCTION CYCLE IS BETWEEN 6-8 MONTHS