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CAGE FISH FARMING FACT SHEET

Introduction

Cage fish farming is an emerging blue economy activity in Tanzania with strong potential to address declining wild fish catches and rising demand for protein. Fisheries sector contributes 1.8% to the national GDP and supports over 6 million Tanzanians however wild stocks have dropped by nearly 20% (2016-2023), from~270,000 MT to ~215,000MT particularly in Lake Tanganyika due to overfishing, illegal gears and climate driven changes in lake ecology.

Tanzania's three major inland lakes: Victoria, Tanganyika, and Nyasa offer unique ecological opportunities for cage fish farming, particularly for Nile Tilapia and African catfish.

Demand for fish protein is expected to rise more than double from 500,000 MT in 2024 to over 1 million MT by 2030, driven by population growth, urbanization, and dietary shifts presenting a strategic investment case.

Production Overview

- **Key Species**: Nile Tilapia (Oreochromis niloticus), African Catfish, selected native cichlids.
- **Production Systems**: Floating cages (15-40 meters depth zones), using formulated feeds and hatchery-supplied fingerlings.
- **Annual Output**: Cage fish production is growing from pilot scale to commercial levels; current estimates under 25,000 MT/year but with potential to exceed 100,000 MT/year by 2035 with adequate investment.
- Farm-gate prices average at TZS 7500/kg.

Key Farming Zones

- **Lake Victoria:** Lake Victoria offers the best scalability for cage aquaculture, extensive 15-40 m shallow shelves, strong market access via Mwanza, and existing artisanal infrastructure making it the priority zone for clustered pilot and commercial scale-up.
- **Lake Tanganyika:** Lake Tanganyika's upper waters are calm and oxygen-stable, good for cages. Kigoma gives strong market access due to its strategic location bordering DRC and Burundi. However, many stretches are very steep, so only a few sheltered spots are suitable for farms.
- **Lake Nyasa:** Lake Nyasa's Tanzanian shoreline is ecologically fragile and has limited shallow areas suitable for cages. Any farming must use native species and low-impact methods to avoid harming unique local fish.

Production and Market cycles in Cage Fish Farming

Cycle element	Timeline / Duration	Key Notes
Stocking (Fingerlings)	Year-round (subject to hatchery supply)	Availability depends on hatcheries; consistent supply is a bottleneck.
Grow-Out Period	6-8 months (Tilapia) / 8-12 months (Catfish)	Biological cycle; determines when cash inflows start.
Harvesting	Flexible (staggered or bulk)	Allows 2 cycles/year if well managed; timing can be adjusted to demand.
Cash Outflows	Immediate at stocking (cages, feed, labor)	Feed is 60-70% of operating costs; financing needed upfront.
Cash Inflows	1st harvest after 8-12 months	Loan products must match this cycle; grace periods critical.
Market Demand Peaks	Dec-Jan (festive), Easter, mid-year export windows	Prices and margins are highest during these periods.
Strategic Leverage Points	Align stocking with high-price seasons	Maximize ROI by matching biological cycles to demand peaks.

Productivity and Profitability Snapshot

Indicator	Best practice (improved inputs & management)	Typical practice
Grow-out period (Tilapia)	6 months	7-8 months
Survival rate	80-90%	65-80%
Feed conversion ratio (FCR)	1.2-1.6	1.6-2.2
Yield per cage cluster	Higher, predictable	Lower, variable
Profitability	ROI uplift 15-40% (with local feed/higher quality fingerlings)	Lower ROI; sensitive to feed price shocks

Cage Fish Value chain Overview

Inputs

- Fingerlings: Demand outstrips supply; quality concerns persist.
- Fish Feed**:** Accounts for 60-70% of costs; more than 90% imported, raising vulnerability to price shocks.

Production

- Farmers operate cages in nearshore zones. Small-scale producers dominate but face high startup costs (USD $5,000-50,000 for small cages).

Post-Harvest

- Limited cold storage and processing leads to 15-25% post-harvest losses.

Markets.

- Tanzania produces 510,547 tonnes of fish annually while national demand stands at 787,167 tonnes creating a deficit of over 276,620 tonnes.
- Urban demand (Mwanza, Kigoma, Mbeya, Dar es Salaam) is strong.
- Exports include dried and fresh fish to DRC, Zambia, Burundi, Canada, US, and EU markets. Export volumes rose by 16.1% from USD 21.5 Millions to approximately USD 25 Millions in 2025.
- According to the International Trade Center The markets with greatest potential for Tanzania's exports of Fresh water fish are Malawi, Zambia and United States.
- Malawi shows the largest absolute difference between potential and baseline exports in value terms, leaving room to realize additional exports worth $428,000, representing 22% of unrealized export potential.

Production and Conversion Pathway

Stage	Input	Typical output / conversion
Stocking	1,000 fingerlings (stocking density depends on cage size)	~800 surviving harvest-size fish (assumes ~20% mortality under average conditions)
Grow-out	Feed + management over 6-12 months	Marketable biomass (Tilapia: 6-8 months; Catfish: 8-12 months)
Primary handling	On-site harvest, bleeding, ice/primary cooling	Reduced spoilage if immediate cooling applied
Processing	Filleting / smoking / drying	Fillets, smoked/dried product (value added)

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Value Distribution Across Cage Fish value Chain

Actor / Service	Function	Estimated Percentage of final retail price
Farmer	Production, harvesting	20-30%
Cooperative / BMU	Aggregation, quality checks	1-2%
Transporter	Lake to market logistics	5-7%
Cold chain operator	Preservation and quality maintenance	3-5%
Processor	Filleting, smoking, packaging	15-25%
Retailer / Exporter	Distribution & sales, export logistics	25-30%

Key Players in Cage Fish Value chain

Category	Players
Farmers& FICOS	Small scale fishers and cooperatives including Youth and women
Processors and exporters	Emerging SMEs and established exporters in Mwanza, Kigoma and Dar es salaam
Regulatory Institutions	Ministry of Livestock and fisheries (Policy oversight) Tanzania Agricultural Development Bank (Financing aquaculture) Beach Management Units (Community Governance) TAFIRI (Research, stock monitoring)

Risks and Constraints

- **High initial costs**: Significant upfront capital for cages, nets, moorings, and water systems excludes smallholders, youth, and women. Short credit histories and limited collateral further restrict financing, constraining entry and scale.
- **Feed dependence & volatility**: Imported feeds comprise 60-70% of operating costs. A 10% price increase reduces ROI by 2-3%; 20% increase cuts ROI by 4-7%, extending payback and heightening vulnerability to supply chain disruptions.
- **Fingerling supply/quality gaps**: Few well-regulated hatcheries supply genetically improved, healthy fingerlings consistently. Inconsistent availability and quality depress survival rates and growth, limiting productivity and undermining farm economics across all three lakes.
- **Post-harvest losses & infrastructure**: Insufficient cold storage and processing at landing sites cause 15-25% post-harvest losses. Farmers sell quickly at lower prices to informal traders, losing access to higher-value domestic and export markets.
- **Finance-production mismatch**: Prevailing 6-12 month loan tenors conflict with 8-12 month grow-out cycles. Repayments begin before first harvest, elevating default risk and discouraging investment in cages, feed, and water systems.
- **Market price fluctuations**: Farm-gate prices vary with wild-catch supply and festive demand. A 15% price drop extends payback by one to two years, reducing margins and increasing working-capital pressure on farmers.
- **Disease outbreaks & biosecurity**: High stocking densities without strong biosecurity can trigger disease outbreaks causing 30-50% output losses. Limited veterinary support and weak fish-health monitoring amplify production risks and financial volatility.
- **Environmental & social risks**: Pollution and exotic species threaten lake ecosystems, especially Nyasa's UNESCO biodiversity. Absence of clear spatial zoning drives conflicts between traditional fishers and cage farms, jeopardizing social license and sustainability.

Risks and Mitigation Matrix

Risk	Impact	Mitigation
Feed price/supply shock	High	Invest in local feed, diversify raw materials (insect/plant protein)
Disease outbreak	High	Strengthen biosecurity, regional fish health labs, farmer training
Finance mismatch	Medium-High	Aquaculture-aligned loan products, grace periods
Environmental damage / species invasion	High (Nyasa)	Strict zoning, EIA, native-first species policy
Post-harvest loss	Medium	Cluster cold rooms, mobile chilling units, processing hubs

Investment Opportunities In the Cage Fish Farming Value Chain in Tanzania

Opportunity	Typical CAPEX (USD)	Returns & Payback Period(P.P)
Local fish feed plant - small	$10,000-50,000	ROI 10-25%; PP 4-7 years
Local fish feed plant - large	$200,000-2,000,000	ROI 20-35%; PP 3-6 years
Hatcheries (fingerling production) - small	$5,000-25,000	ROI 15-30%; PP 3-5 years
Hatcheries - large	$100,000-500,000	ROI 25-45%; PP 2-4 years
Cold storage & processing - small	$20,000-100,000	ROI 12-20%; PP 5-8 years
Cold storage & processing - large	$500,000-5,000,000	ROI 15-25%; PP 6-10 years
Cage manufacturing (local)	$5,000-500,000	Quick payback; reduces import reliance
Processing factories	$20,000-10,000,000	Long term, higher NPV for export products

Ranges drawn from the investment case by the consultant suitable for early stage financial modelling

Proposed Financing Models

- **Aquaculture-aligned term lending** : To provide medium-to-long term loans with extended grace periods and bullet repayments matched to 8-12 month grow-out cycles, protecting farmers from pre-harvest repayment pressure and financing cages, feed, aeration and systems.
- **Blended finance**: Combine concessional loans and grants from development partners with commercial bank capital and partial guarantees to de-risk private investment in feed mills, hatcheries, cold chains and processing, lowering cost of capital and accelerating scale.
- **Public-Private Partnerships (PPPs):** Structure PPPs where government provides land, permitting and enabling policy while private partners supply technical expertise, equity and long-term management for high-capex processing plants, cold-chain hubs and integrated hatchery clusters.
- **Community-based group lending (Wavuvi model)**: Scale cooperative lending and group guarantees to reach youth and women, leverage social collateral, shared procurement and co-invested cold storage, and accompany loans with technical assistance to boost repayment and inclusion.
- **Cluster financing model**: Channel financing through Fisheries Cooperative Societies (FICOs) to support farmer clusters with shared cages, feed procurement, and cold storage. Collective lending lowers transaction costs, spreads risk, and uses group guarantees to enhance creditworthiness. Anchoring finance in the FICOS also enables bulk input supply and structured off-take agreements, strengthening repayment capacity and inclusive participation.