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Unlocking the Economic Potential of Malawi's Aquaculture Sector through Commercialisation

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Key Messages

- Aquaculture is Malawi's best shot at closing the fish supply gap, but commercialization is a setback.
- Limited availability of quality fingerlings, inadequate investment in technologies, lack of regulatory frameworks for quality assurance systems, geographic barriers to input access and rising costs of fish feed are major constraints to aquaculture commercialization.
- Cage culture and common carp yield higher returns than pond farming and tilapia, respectively, underscoring the potential of improved technologies and species diversification to enhance performance.
- The key recommendation is for Malawi to expand the commercial fingerling and feed supply, scale economically viable community-based commercial models, strengthen extension services, and promote new skills and techniques among producers.

Introduction

Fish is Malawi's most important source of animal protein, contributing significantly to household nutrition. Fish also contribute significantly to livelihoods at various levels of the value chain. However, affordability is currently being constrained by low supplies of both capture and farmed fisheries. Fish production from capture fisheries has declined due to overfishing, environmental degradation and climate variability, resulting in declining per capita fish consumption, increasing unit prices and widening demand-supply gaps.

It is therefore not surprising that aquaculture has assumed increasing strategic importance in national policy frameworks, including the National Fisheries and Aquaculture Policy, the National Aquaculture Strategic Plan II and Malawi 2063[1,2,3]. Furthermore, several government and development partner investments and initiatives have been implemented to boost the aquaculture sector.

Despite these investments and policy support, the aquaculture sub-sector remains underdeveloped. The sub-sector is dominated by smallholder producers operating at subsistence or semi-commercial scales. Consequently, current policy

and development efforts increasingly emphasize commercializing the value chain to improve productivity, competitiveness, profitability, and resilience while creating decent employment opportunities for rural communities.[4]

The broader European Union (EU) funded *Ulimi ndi Chilengedwe (UCHI) Programme* is one of the interventions supporting the commercialization of aquaculture in Malawi. This policy brief presents the results of a deep-dive analysis conducted by the MwAPATA Institute to highlight the critical factors that will influence a successful transition from subsistence to commercial aquaculture in Malawi.

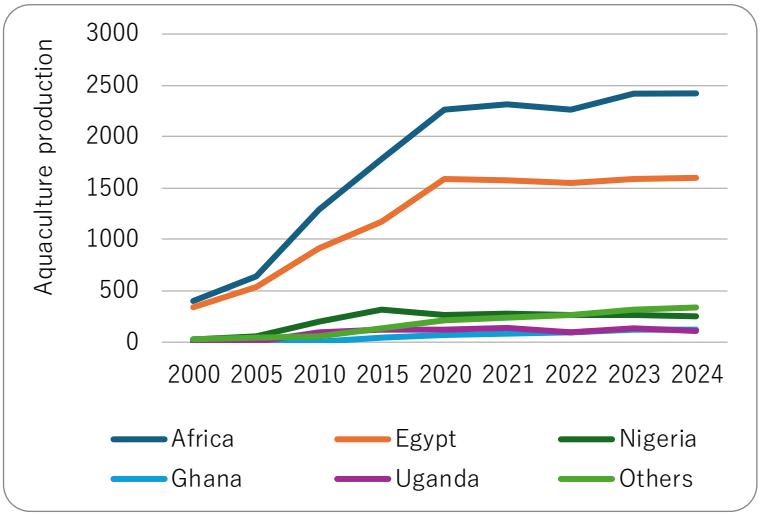
Methodology

The aquaculture deep dive drew on both primary and secondary data sources, consolidating stakeholder perspectives and existing evidence. Primary data collection followed a multi-stakeholder consultative approach, targeting key aquaculture players from public and private institutions nationwide. Specifically, key informant interviews were conducted with input suppliers, fingerling and feed producers, pond- and cage-based grow-out farmers (both large- and small-scale), policymakers, and aquaculture project implementers. Secondary data were sourced from FAOSTAT, Trade Map and existing publications.

Global and regional aquaculture production overview

Global aquaculture production has increased from 32,539 million tons in 2000 to 102,664 million tons in 2024. This growth has led aquaculture's share of aquatic animal production to exceed that of capture fisheries since 2021. At the African regional level, aquaculture production has grown substantially from less than 400,000 tonnes in 2000 to approximately 2.4 million tonnes in 2024 (**Figure 1**). However, this growth remains below that of capture fisheries and is highly concentrated in a few countries, particularly Egypt, whose production accounts for over 60% of the continent's aquaculture output. Other countries contributing a noticeable share of production include Nigeria (11%), Ghana (5%), and Uganda (4%) (FAO, 2026).

Figure 1: Regional aquaculture production volumes (in thousand tonnes).



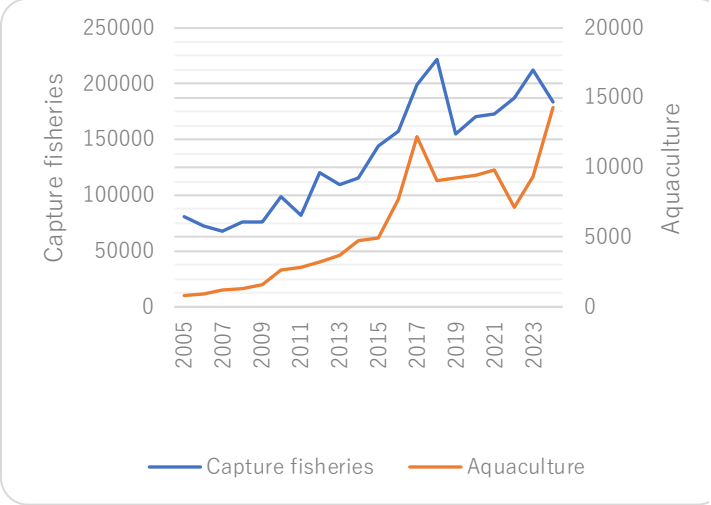
Source: Authors' compilation from the State of World Fisheries and Aquaculture (FAO, 2026)

Local aquaculture production overview

Malawi aquaculture production exhibits a strong long-term upward trend, increasing from about 800 tonnes in 2005 to approximately 14,000 tonnes by 2024 (**Figure 2**). This growth can be attributed to several government and development partner aquaculture initiatives, including the Aquaculture Value Chain Project implemented by the Deutsche Gesellschaft für Internationale Zusammenarbeit(GIZ) from 2018, the Aquafish project implemented by the Food and Agriculture Organization (FAO) of the United Nations,

WorldFish and the government of Malawi; the Kulima programme; the DeSIRA programme; Integrated Aquaculture-Agriculture implemented by Cooperative Development Foundation (CDF) of Canada; the Agriculture Sectorwide Approach (ASWAp), funded by the multi-donor trust fund, among others. Despite such investments, aquaculture currently accounts for only a small share of Malawi's total fish supply, while capture fisheries remain the dominant supplier. Malawi's total fish supply is not sufficient to meet local demand, resulting in 588 tons of fish imports as of 2024, according to Trade Map statistics.

Figure 2: Malawi capture and aquaculture production volumes



Source: Malawi Government annual economic reports (2025)

Aquaculture Value Chain Actors

Actors in the aquaculture value chain are mainly involved in input supply, production, marketing and post-harvest handling (**Figure 3**). The main inputs to aquaculture production are fingerlings, fish feed, agricultural lime for pond-based farming, and, lastly, labour. Whilst agricultural lime and labour are important inputs, fingerlings and fish feed are major inputs affecting aquaculture productivity in Malawi.

Major inputs in aquaculture production

Fingerings

National fingerling production from both public and private hatcheries in Malawi was estimated at 6.2 million, compared with an estimated national demand of more than 13 million fingerlings, based on current pond hectarage and cage culture capacity. This represents a supply deficit of nearly 50%, forcing many fish farmers to rely on recycled fingerlings from their own ponds or neighbouring farmers rather than purchasing certified stock. Continued use of recycled fingerlings contributes to inbreeding, declining genetic quality, slower growth rates, poor survival, and ultimately lower fish yields and profitability.

Malawi has considerable hatchery infrastructure that, if fully utilized, could meet the country's current demand for quality fingerlings. For instance, public institutions such as Lilongwe University of Agriculture and Natural Resources (LUANAR) and Domasi Aquaculture Centre (DAC) possess technical expertise and state-of-the-art hatchery facilities with large capacities. Domasi also plays a strategic role in managing the Genetic Improvement Programme for Oreochromis shiranus. Other public hatcheries, such as Kasinthula and Mzuzu, operate on a much smaller scale due to inadequate infrastructure and equipment.

The private sector also contributes significantly to fingerling production. Large commercial specialized operators maintain their own hatcheries to guarantee uninterrupted supplies of

fingerlings while also supplying other producers. Besides, several medium-scale hatcheries operate in Thyolo, Lilongwe, and Mulanje, although their production is generally determined by market demand. In contrast, many small-scale hatcheries established through previous projects have ceased operations due to limited financial support. This implies that main fingerling suppliers in Malawi are the public institutions and large commercial farmers.

In terms of species preferences, Tilapia species, particularly *Oreochromis shiranus*, dominate fingerling production due to strong farmer demand, with increasing preference for fast-growing, sex-reversed all-male fingerlings. Demand for catfish fingerlings is also increasing, while common carp production remains limited to designated aquaculture zones.

Fish feed

Fish feed is the largest production cost in aquaculture and remains a major constraint to sector growth in Malawi. Feed cost accounts for over 80% of total production costs for commercial farmers and 60% for smallholder pond-based production. Government reforms introduced in 2021, including Value-Added Tax (VAT) exemptions on fish feed and aquaculture inputs, have stimulated private-sector investment, resulting in the establishment of four local feed manufacturers: Apoche, Terrain, Central Poultry Feeds, and Maldeco. Together, these companies have a combined production capacity of 16 tons per hour. In addition, the Domasi and Mzuzu Aquaculture Centres have feed mills with a combined capacity of 9 tons per hour, but these facilities are currently not operational. The local feed manufacturers are the main fish feed suppliers in Malawi.

This implies that current feed manufacturing capacity is sufficient to meet Malawi's estimated annual demand of about 10,000 tons. The operational private feed mills alone could produce more than 55,000 tons annually, indicating substantial potential to support future aquaculture expansion. However, fish feed production remains well below capacity because of high manufacturing costs and weak market demand. Furthermore, most farmers still regard imported fish feed highly for its quality and performance despite the price being 35% higher than locally produced feed, on average (Table 2). The cost of commercial feed, whether imported or local, remains a barrier to wider and more consistent adoption among fish farmers, hence limited market demand.

Table 1: Fish feed prices per kilogram in Malawi Kwacha

Feed source	Pre-starter	Starter	Grower	Finisher
Imports	6,400	6,000	5,800	5,600
Locally made	4,533	4,133	3,687	3,427
Difference (%)	29	31	36	39

Source: Authors' compilation based on stakeholders' consultations

Aquaculture production

Aquaculture in Malawi is practiced through three main production systems: extensive (small-scale), semi-intensive (medium-scale), and intensive (large-scale). Extensive systems rely on family labour and locally available resources, with production primarily aimed at household food security and surplus sales. Semi-intensive systems use improved inputs, including commercial feed, fertilizers, and quality fingerlings, to supply local and urban markets. This should be the target group

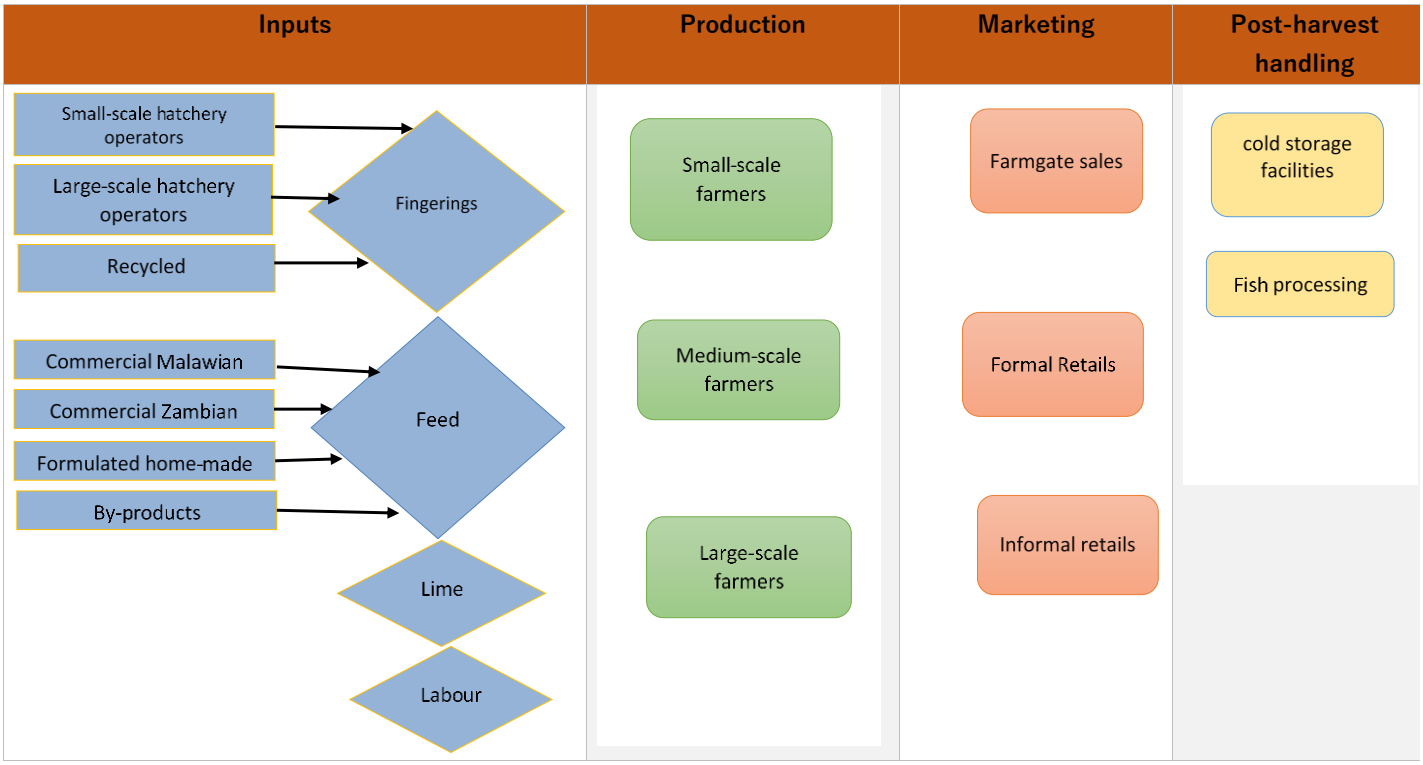
for smallholder aquaculture commercialization. However, evidence shows that aquaculture in Malawi is dominated by small-scale producers.

Intensive production systems employ high-input, commercial production methods, including cage culture, which has expanded beyond large commercial operators to include emerging small-scale cage farmers. Integrated Agriculture-Aquaculture Systems (IAAS) and Aquaponics are emerging innovations aimed at improving agricultural productivity and resilience.

Aquaculture marketing and post-harvest handling

Low aquaculture production hinders the development of fish markets in Malawi. Most farmers sell their fish from fishponds directly at the farm gate, and existing off-takers struggle to source sufficient quantities to meet market demand. Government interventions under the Sustainable Fisheries and Aquaculture Development (SFAD-MW) project and the Malawi Food System Resilience Programme (MFSRP) - Agriculture Commercialisation (AGCOM) 2.0, aimed at developing markets and fish processing through capacity building in post-harvest handling and the establishment of cold storage facilities, have not been fully utilized. In contrast, large-scale commercial producers, such as MALDECO, have well-developed post-harvest infrastructure, including cold storage facilities, fish smoking kilns, and transportation vans, supported by an extensive nationwide distribution and outlet network.

Figure 3: Aquaculture Value Chain Stakeholders' Map



Source: Author's characterization based on stakeholder consultations

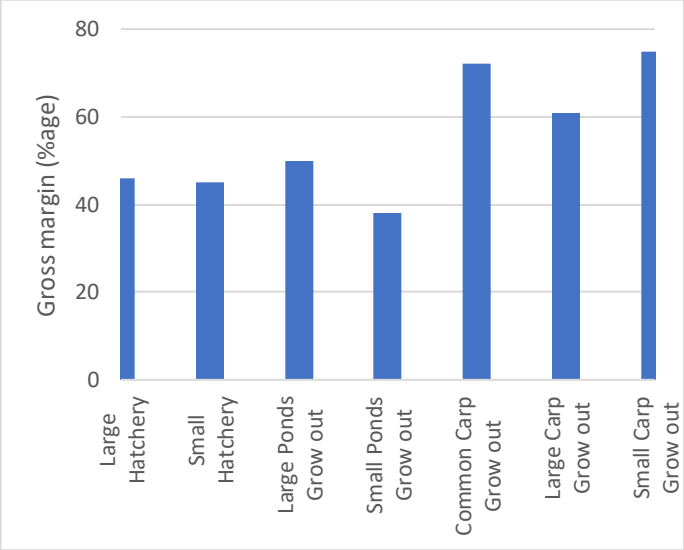
Profitability of the aquaculture value chain enterprises

Hatchery and grow-out are the major operations that involve both large and small-scale actors in the aquaculture value chain in Malawi. While there are limited players in feed manufacturing and distribution, there are a considerable number of players involved in hatchery operations and actual fish farming across all the regions of Malawi.

The gross margin analysis indicates that hatchery operators return 45% of total sales revenue as net profit on average (**Figure 4**). Hatchery operations involve managing broodstock and fry, both of which are crucial life stages that require specialized care. To boost fertility, broodstock are fed specialized commercial feed, while fry require high-crude-protein feed and careful handling to ensure growth and minimize mortality. These high-value inputs and skilled labour requirements increase management costs, thereby reducing gross margins. However, high demand allows operators to breed as often as every two weeks, resulting in strong annual margins.

Grow-out gross margins are presented by the farming system, production scale and fish species. Intuitively, large-scale aquaculture makes higher margins than small-scale due to intensive use of inputs and economies of scale. Our further analysis indicates that for commercial small-scale farmers to break even, they need to operate a pond of 380m^2 while using both commercial and locally available feed. Therefore, commercialization drive should target medium-scale farmers with not less than 400m^2. Pond-based Common Carp yields the highest margins at 72%, compared to an average of 50% for tilapia intensive pond-based systems.

Figure 4: Gross margin percentages for hatchery and grow-out operations



Source: Authors' computations

This profitability gap is driven by productivity differences; under ideal conditions, Common Carp yields (6.75 kg/m^2) significantly exceed those of intensive pond-based tilapia (1.5 kg/m^2). Therefore, the production of exotic breeds is highly profitable and should be promoted to boost the local fish supply. However, to protect local species, zoning restrictions limit Common Carp production to the Lower Shire. Currently, commercial Common Carp production is centered at the Kasinthula Aquaculture Centre in Chikwawa through a public-private partnership and has not yet been scaled to smallholder farmers. The small-scale extensive

system has the lowest gross margin of 38%, with productivity averaging 0.5 kg/m². Small-scale fish farmers usually feed their fish homemade formulated sinking feed, kitchen waste, or other crop byproducts such as maize bran.

The analysis further reveals that cage-based tilapia production is more profitable than pond-based systems. Large commercial tilapia cage farming yields a 61% profit margin, whereas small-scale cage-based production yields 74%. Both systems are highly profitable compared with similar pond-based systems. This disparity is due to the optimal growth environment provided by natural water bodies and higher stocking densities in cage systems. Conversely, pond-based systems require intensive management of oxygen, pH, and temperature to maintain the aquatic ecology necessary for growth.

Challenges facing the aquaculture value chain

The systemic challenges constraining the aquaculture value chain are patterns of accessibility to feed and fingerlings, major inputs in aquaculture production.

- Limited availability of quality fingerlings remains one of the most critical constraints to the growth and productivity of Malawi's aquaculture sector. Fingerling production from public institutions remains below potential because their primary mandates focus on research and training, while investment in commercial-scale production is limited.
- Inadequate investment in technologies to enable a consistent supply of fingerings. Most hatcheries in Malawi reduce production during winter (May to August) due to inadequate investment in technologies, such as solar-powered hatchery systems, that would enable year-round production.
- Lack of regulatory frameworks for quality assurance systems. Malawi has developed hatchery operation guidelines to promote the production of healthy, high-quality tilapia fingerlings and improve hatchery management. However, these guidelines are not supported by enforceable quality standards, regular monitoring systems, or a national certification framework, limiting their effectiveness in assuring fingerling quality across the sector. Furthermore, locally produced feed costs about 35% less than imported feed; however, many farmers continue to prefer imported brands because of their perceived superior quality. Limited feed performance trials and the absence of robust quality assurance systems have slowed farmer confidence in local brands.
- Geographic barriers to input access. Access to quality fingerlings is constrained by geographic concentration because hatchery operators are concentrated in a few districts, making it difficult and costly for many farmers to access certified fingerlings. Consequently, farmers often travel long distances or resort to recycled fingerlings. In addition, most feed mills are located in the Central Region, which increases transport costs and limits timely access for farmers in the Southern and Northern regions.

- Rising costs of fish feed. Feed manufacturers face rising production costs due to dependence on imported raw materials, particularly fish meal and blood meal, whose supply has been disrupted by persistent foreign exchange shortages. Local alternatives, including insect-based protein sources, are not yet available at a commercial scale. Electricity outages further increase production costs by forcing manufacturers to rely on diesel-powered generators
- Climate change was identified as one of the key threats to the growth and sustainability of the aquaculture sector. The increase in climatic risks, such as droughts and floods, may hinder the substantial investments already made in the sector. The recent cyclones damaged ponds, hatcheries and other aquaculture infrastructure in most parts of Mulanje, Phalombe, Thyolo, Chiradzulu and Chikwawa. The cyclones have also previously disrupted the Genetic Improvement Program at Domasi and Mzuzu University by flooding fish breeding ponds. Furthermore, Malawian fisheries and aquaculture sector has been recently affected by the EUS fish disease outbreak and evidence shows that some EUS outbreaks are associated with heavy rainfall, flood events, and temperature fluctuations.

Proposed interventions and investments to improve the aquaculture value chain

Based on the findings, we present policy options to address systemic constraints to the commercialization of the aquaculture sub-sector:

- Promote commercial fingerings production by promoting investment in solar-powered hatchery infrastructure hence unlocking underutilized public hatchery capacity (for LUANAR and Domasi). Private investments should also be promoted through public private partnership (PPP) arrangements so as to increase access to certified fingerings. Policy interventions should deliberately focus on creating an enabling investment environment, including improving access to affordable finance to support investment in technologies such as a solar-powered hatchery system. Increased investments in fingerling production would close the fingerling supply gap and reduce reliance on recycled, low-quality stock.
- Enhance fingerings and feed distribution networks through quality assurance systems**.** Expand geographical distribution networks for certified hatchery operations and feed manufacturing by enforcing existing hatchery operations guidelines through a functioning national certification system and promoting extensive fish feed trials across various geographical locations, seasons and species.
- Finance and scale economically viable community-based commercialization models. Encourage investments in commercial and medium-scale aquaculture through financing, given that capital is a major constraint to commercialization, particularly for pond digging, access to fingerlings and feeding. While the government targets cage production investments, similar efforts should be made on pond farming through programs like UCHI.

Furthermore, successful pilot initiatives, including community cage culture, integrated aquaculture-agriculture systems and commercial hatchery enterprises, should be scaled through evidence-based investment programmes. For instance, MALDECO's 'One Village, One Cage' (OVOC) model, under which Beach Village Committees are allocated cages on Lake Malawi and supported with inputs and market access, to additional lakeshore communities

- Promote investments in local fish feed by accelerating the commercialization of locally produced alternative crude protein sources, including insect-based feeds such as black soldier fly and other insect-based ingredients, and by strengthening linkages between feed manufacturers and domestic crop value chains to reduce reliance on imported fishmeal and ease the forex-driven cost pressures currently facing feed millers.
- Close the aquaculture extension gap by strengthening aquaculture extension, innovation and technical capacity. Commercialization requires a transition from generalized agricultural extension towards specialized aquaculture advisory services. Additional aquaculture extension personnel
- need to be recruited to strengthen farmers' business and technical skills, expand digital extension platforms and enhance collaboration among research institutions, universities and the private sector to accelerate the adoption of productivity-enhancing technologies.

Diversify species and expand the production of high-performing fish species through a risk-based aquaculture zoning framework. The government should accelerate the implementation of aquaculture zoning under the revised Fisheries legislation to facilitate the controlled expansion of commercially viable exotic fish species, such as Common Carp, in ecologically suitable areas. Evidence from the Kasinthula Aquaculture Centre demonstrates that Common Carp production can generate substantial returns.

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