



**NATIONAL FISHERIES
AUTHORITY**
PAPUA NEW GUINEA



AQUACULTURE IN PAPUA NEW GUINEA



OVERVIEW

Aquaculture in Papua New Guinea (PNG) is an emerging industry that has grown steadily since its introduction in the 1950s by the Australian colonial administration. Initially aimed at addressing protein deficiencies and stunting in inland areas, aquaculture has evolved from small backyard farms to semi-commercial operations, supplying the domestic market. With its pristine and disease-free environment, PNG's aquaculture industry holds significant potential for growth and access to premium markets.

COMMONLY FARMED FISH

Several species have been introduced to PNG's aquaculture sector over the years. Currently, two of the most commonly farmed freshwater finfish species are The **GIFT Tilapia** (*Oreochromis niloticus*) and **Carp** (*Cyprinus carpio*), which are widely cultivated across the country.

The **Rainbow Trout** (*Oncorhynchus mykiss*), a cold-water species, is farmed primarily in PNG's highland regions, where temperatures are typically below 21°C. It is farmed in semi-commercial setups targeting niche markets, including high-end shops, hotels, and restaurants.



MARINE SPECIES CULTIVATED IN PNG

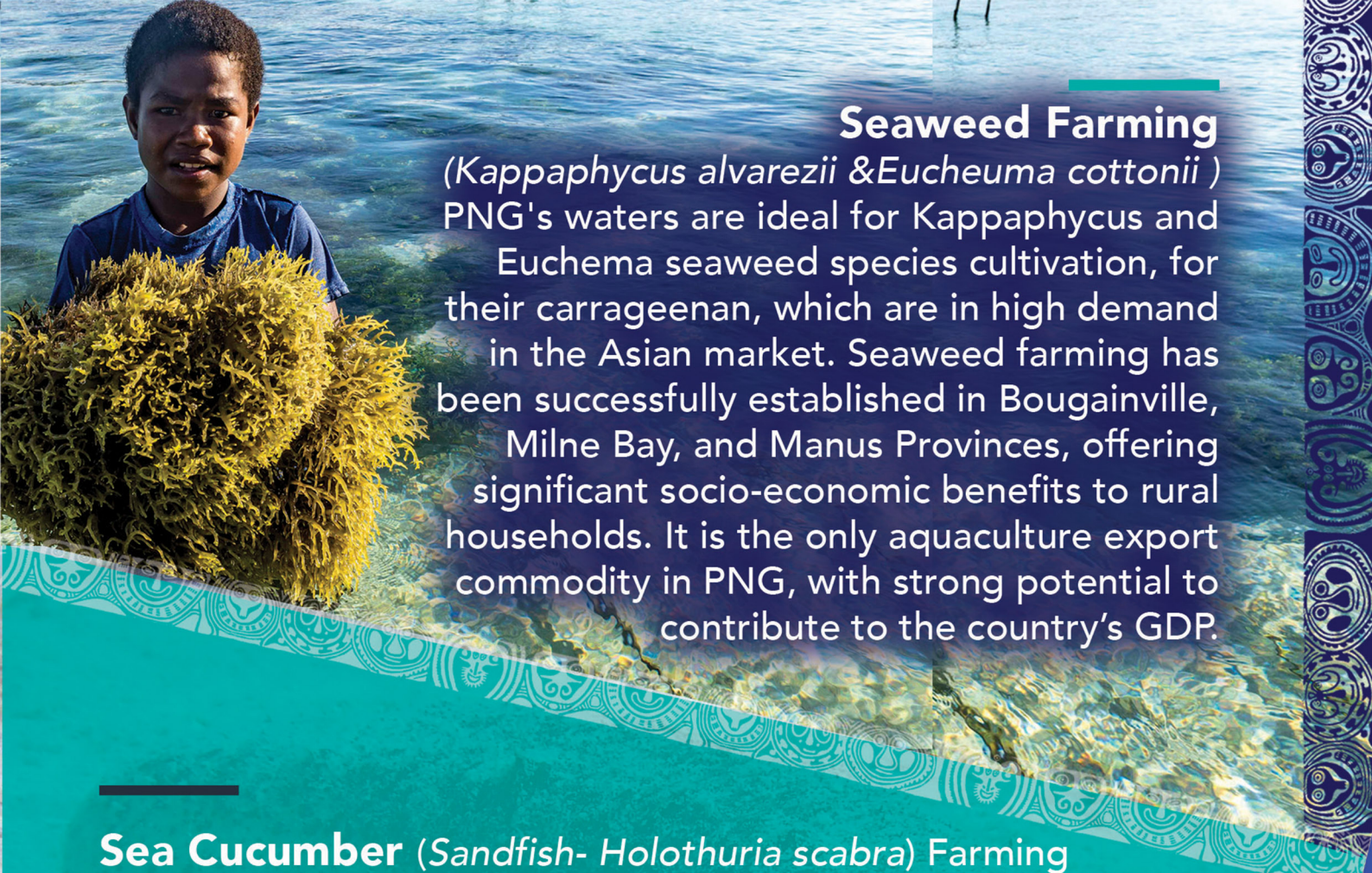
Milkfish (*Chanos chanos*) Farming

Milkfish, a warm-water species, thrives in temperatures between 20°C and 33°C and is economically viable to farm due to its herbivorous diet, which helps reduce feed costs. In floating cages, stocking densities of 40-100 fish per cubic meter can yield 20-45 tons per crop. The species is primarily farmed at an artisanal level, especially in Manus Province, with one farm progressing to semi-commercial production. Milkfish fingerlings are sourced from the wild and grown in cages until they reach marketable size. Plans are underway to establish a dedicated milkfish hatchery in PNG.

Barramundi (*Lates calcarifer*)

A barramundi farming initiative in Madang (2010) was discontinued due to personal reasons. However, a new multi-species hatchery has been established in Daru, with hatchery production now underway. Barramundi performs well in waters between 20°C and 33°C and can be farmed in both ponds and cages. It requires a high-protein diet, with annual production from ponds reaching 10-15 tons per hectare. It has potential for large scale commercial farming.





Seaweed Farming

(*Kappaphycus alvarezii* & *Eucheuma cottonii*) PNG's waters are ideal for *Kappaphycus* and *Eucheuma* seaweed species cultivation, for their carrageenan, which are in high demand in the Asian market. Seaweed farming has been successfully established in Bougainville, Milne Bay, and Manus Provinces, offering significant socio-economic benefits to rural households. It is the only aquaculture export commodity in PNG, with strong potential to contribute to the country's GDP.

Sea Cucumber (Sandfish- *Holothuria scabra*) Farming

Sea cucumber farming, especially for high-value species like Sandfish (*Holothuria scabra*), has gained significant commercial interest. A private commercial hatchery was established in West New Britain Province in 2022. This low-cost aquaculture option is attracting foreign investors. Ongoing research in PNG is focused on improving juvenile survival rates and optimizing growth rates and stocking densities to ensure market-ready production.



SOME EXISTING COMMERCIAL FARMS IN PNG

Manus Milkfish Farm

This is a recent commercial farm established by local investor in Manus and relies on using wild caught fingerlings. Seasonality of fingerlings affect production, but currently managing a production of 5 ton annually and supplying the local market.

ASK Sanctuary Tilapia Farm:

ASK Sanctuary Tilapia Farm is a family-run cage culture tilapia farm and hatchery located near the Yonki Dam, to the northeast of Yonki Township in Eastern Highlands Province. This project is part of a broader initiative within the reservoir area, aiming to boost fish production and contribute to the local economy, benefiting the surrounding communities.

The farm's production capacity includes:

- 600,000 to 700,000 fingerlings annually
- 17 to 20 tons of marketable table-sized fish annually

The project aims to meet the growing demand for fish in the Lae and Goroka markets, where demand is currently high. Additionally, there is potential to expand into markets within the extractive and hospitality industries.



Betty Higgins trout Farm

This farm is located at the foot of the highest peak in PNG, (Mt Wilhelm). It is a 7-ton production that supplies the high-end market in PNG. The farm has contract to supply the coral sea hotel market chain.

Mt. Giluwe Kalopa Trout Farm

The Mt. Giluwe Kalopa Cooperative Society Ltd, located at the Upper Mendi area of PNG's second-highest mountain, has been in operation since 2010. Initially a community-based venture, it has now scaled to commercial levels, with a production capacity of 300-400 tons per year, expected to reach full capacity by 2025. The farm produces 3-4 million fingerlings annually, with hatchery survival rates around 70%. The farm's marketable trout (450-600 grams) is sold to local shops, restaurants, and at expos and seminars

Innovative Agri-Industries & PNGSD integrated multispecies farm in Daru

This is a recent investment by innovative agro-industries, an Israeli company in partnership with PNG investor. They are currently establishing a multispecies facility for the production of barramundi, sea cucumber and sea horse. They have plans for inclusion of other species such as mud crabs and estuarine species.

Sirinumu Fish Farming

Located in the Sirinumu Reservoir in Central Province, the Sirinumu Fish Farming project has been operational since 2006. This family-based small-to-medium enterprise (SME) now operates 8 pontoons with 64 cages, capable of producing 128 tons of fish per crop. The farm aims to supply major retail outlets in Port Moresby and expand to other centres. There is significant market demand for fish in Port Moresby, which the project is well-positioned to meet.

SPECIES WITH POTENTIAL FOR COMMERCIAL FARMING IN PNG



Pearl Farming (Golden Lip - *Pinctada maxima* & Black Lip- *Pinctada margaritifera*)
Pearl farming in PNG dates back to 1958, with the most recent farm on Samarai Island ceasing operations in 2013. Despite this, the region's tropical climate remains favourable for pearl cultivation, offering an opportunity to revive the industry. Pearl aquaculture is a low-cost investment, ideal for small-scale and village-based operations.



Marine Prawn Farming (*Penaeus monodon*)

Indigenous Giant Tiger Prawn farming was initially trailed and successfully farmed by Coconuts Industries Ltd in Rabaul in 2008 but ceased due to change in company ownership. Nonetheless, there is still high potential for large scale commercial prawn farming on the coast. Despite the complexity and high cost of hatchery and culture techniques, the tiger prawn can grow large (40-60 grams) and fetch premium prices in international markets. PNG's brackish water environment is ideal for prawn farming, and the country has yet to experience any major prawn disease outbreaks.



Giant Freshwater Prawns

(*Macrobrachium rosenbergii* & *Macrobrachium spinipes*)

These prawns, indigenous to PNG waters, have both domestic and international market potential. Research is ongoing into hatchery production and cultivation of *Macrobrachium rosenbergii*, with promising results.



Freshwater Eels (*Anguilla bicolor*)

Freshwater eels are in high demand in export markets, particularly in Japan and Southeast Asia. Naturally available juvenile eels from the wild can be sourced for farming to tap into this lucrative market.



Tropical Rock Lobster (*Panulirus ornatus*)

Tropical rock lobsters can be farmed through the collection of juveniles (puerulus) from the wild, a practice common in Southeast Asia. Hatchery technology has been developed elsewhere but not readily available for all to use.



Mud Crabs (Genus: *Scylla*)

The live mud crab export market is a thriving fishery, with opportunities for hatchery development to cater to soft-shell markets and support sustainable restocking.



Sea Cucumber (White Teatfish - *Holothuria fuscogilva*)

Following the success of sandfish farming, there are opportunities to culture other high-value sea cucumber species, such as the White Teatfish.



Seahorses

Seahorses are in demand for traditional Eastern medicine, the curio trade, and the marine ornamental aquarium trade. Farming sea horse to access these markets is an opportunity yet to be explored.

CHALLENGES

The sector faces several challenges, including limited infrastructure, lack of technical skills, high operational costs, and difficulties in accessing quality feed and seed stock. Additionally, the remoteness of many potential farming areas complicates supply chain logistics and market access.

GOVERNMENT / NFA INITIATIVES

Hatchery Initiatives: Satellite hatcheries for trout and tilapia have been established by the NFA throughout PNG through public-private partnerships, aimed at increasing the production and supply of high-quality seedstock.

Feed Supply: The NFA has been subsidizing imported fish feed as a short-term remedy for non-availability of commercial fish feed in PNG. A long-term solution is being developed through collaboration with Farmset Limited, a nationally owned livestock feed producer, which is set to begin fish feed production in 2025.

Training and Capacity Building: NFA and the National Fisheries College (NFC) have been conducting targeted trainings for farmers and extension officers to strengthen aquaculture technical capacity across the country.

Nucleus Estate Concept: To achieve economies of scale, the nucleus estate concept is being implemented through centralized, private hatcheries that will distribute fingerlings to farmers and provide essential support. That private entity will purchase the fish from these farmers for processing and distribution. Additionally, the holding and processing facilities will undergo audits and certification by the NFA, ensuring compliance with food safety standards. This certification will enable access to premium markets, including mines, hotels, and high-end retail shops.

Fish for Schools Program: The Fish for Schools program is an initiative by the NFA aimed at imparting fish farming knowledge and skills to students. This program is currently active in several secondary schools throughout PNG.

Fish for Prisons Program: The Fish for Prisons program is a rehabilitation initiative run by the NFA for inmates in a few prisons. This program has successfully enabled many convicts to become skilled farmers and respected members of their communities after serving their sentences.

CONCLUSION

The aquaculture industry in PNG holds significant potential to enhance food security, generate income, and create employment opportunities. PNG's existing policy and regulatory frameworks supports commercialisation of aquaculture through foreign investments. Continued investment in research and development, coupled with private sector partnerships, will be crucial to overcoming current challenges and unlocking the full economic potential of aquaculture in the region.



Aquaculture training at the National Fisheries College (NFC)



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