

NURTURING GREEN AQUACULTURE IN MYANMAR

Aquaculture in Myanmar

Key Statistics

8.1 million hectares (ha) inland freshwater areas

1.3 million ha are permanent

>200,000 ha are used as aquaculture ponds - mostly for fish and shrimp

US\$ 785 million export value of fishery products in FY 2020-2021

8.6% decrease from previous FY, after 16% average annual growth from 2014/15 - 2019/20

>5 MMT total fisheries production

Around 20% are contributed by aquaculture

3.2 million total employments in fisheries

Around 800,000 are full-time

>600,000 people are directly employed in aquaculture

27% higher average daily wages at aquaculture farms compared to crop farms

Fish farms require almost four times more labor per acre than crop farms

- Small growout farms generate demand for 152 labor days per acre per year
- Medium-sized farms generate demand for 41 labor days per acre per year
- Large-sized growout generate demand for 17 labor days per acre per year

Aquaculture continues to be a male-dominated sector. Less than 20% of MSMEs are owned or managed by women

MSMEs also reported that less than 10% of their casual workers are women

Key Environmental Challenges

Clearance of vegetations for aquaculture

+ Feeds + Fertilizers + Antibiotics, hormones

+ Parasites & pathogens + Chemical substances/compounds + Exotic invasive species

AQUACULTURE POND

RIVER/STREAM/LAKE/COAST

Food miles

+ Nitrate + Ammonium + Organic waste

+ Toxins + Algae blooms + Nutrients + Bacteria decomposition

+ Anoxic conditions

Negative Consequences:

Biodiversity losses | Disruption of ecosystem processes | Water contamination

Pollutants entering food chains | Low aquaculture productivity

Greenhouse gas emissions

Yangon - Ayeyarwady Aquaculture Corridor

Key Production Centers

It is home to aprox. 60% of Myanmar's farmed fish production

MSMEs dominate the sector

- 49% Micro enterprises (incl. informal fish farming households)
- 32% Small enterprises
- 19% Medium enterprises
- Large enterprises

Ponds are mainly stocked with native carp - with rohu topping the list, followed by common carp, catla and non-native tilapia

Other common species are freshwater pomfret, striped catfish and giant freshwater prawn. Whiteleg shrimp has been more recently introduced but slowly gaining popularity.

Rohu, Migral, Catla, Common carp, Stripped catfish, Tilapia, Freshwater pomfret, Whiteleg shrimp, Grass carp, Giant freshwater prawn, Minor carp

Common Production Systems

Ecosystem structure

Technology & inputs

Earthen pond (predominant)

Concrete pond

Rice + fish system

Floating cage or pen in natural aquatic system

Extensive

Semi-intensive (predominant)

Intensive

Yangon - Ayeyarwady Aquaculture Corridor

Key Features

Feed is the largest operating expenditure, on average accounting for around 70%

Commercial (1/3)

Homemade (2/3)

Feed (~70%)

Non-feed inputs (~7%)

Labor (~4%)

Others (~10%)

Seed (~9%)

Own production (~6%)

Collect from nature (~5%)

Brokers (6%)

Hatcheries or nurseries (~83%)

Production period varies depending on different factors, mainly variety grown

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Weather	Sunny	Sunny	Sunny	Sunny	Cloudy	Cloudy	Cloudy	Cloudy	Cloudy	Cloudy	Cloudy	Cloudy
Precipitation (mm)	5.8	3.3	21	188.1	339.6	304.9	300.4	313.5	178.2	15	1.1	
Temperature, maximum & minimum (Celsius)	23/17	35/19	37/21	38/24	34/24	32/23	31/23	31/23	31/23	33/23	24/22	33/18
Fish Culture												
Pond preparation												
Stocking												
Culturing*												
Partial Harvesting												
Harvesting												
Shrimp Culture												
Pond preparation												
Post larvae collection**												
Growing out***												
Harvesting												
Rice-Fish Culture												
Land preparation												
Stocking												
Culturing****												
Harvesting												

* Period of fish culture depends on species, some are around 6-8 months, but Migral can take up to 2 years

** For P. Monodon, while Vannamei post larvae comes from hatchery

*** P Monodon will take around 5-6 month growing period, while Vannamei only 2-3 months

**** Climbing perch, tilapia, or other common carp are among common fishes

~5 TON/HA average yield; relatively modest but has high potential to be increased; yield varied according to level of intensification and variety grown

Aquaculture creates local markets for goods and services, including labor, rental boats, delivery vehicle, ice, fingerling, other inputs

>2 TIMES/HA returns generated from aquaculture compared to crop farming; fish farming households or MSMEs are better off than the general population

Aquaculture is highly commercialized with traders from Yangon's San Pya seafood wholesale market as main buyer

Nurturing Green Aquaculture

An opportunity exists to introduce green tech and production practices, to reduce costs, improve productivity while minimizing negative environmental impacts

Feed (~70%)

One of the key problems, reliance on subjective judgments made by manual labor, undermines appropriate feeding requirements and results in increased waste and cost, reduced water quality, and productivity

Improve feeding (the largest single cost item in aquaculture production) as an entry point to promote Green Aquaculture Practices (GrAqP) and tech

- Increase the feeding efficiency and lowering eFCRs, while substantially reducing feeding cost (>30%)
- Complement with other measures to further improve productivity and reduce negative environmental impacts

Assess environmental impact

Monitor water quality

Source feeds & seeds responsibly

Proper use of inputs

Better feeding management

Plan & monitor farm using tech

Promote circular economy

Scale up through green finance

Protect & restore vegetation

AQUACULTURE POND

Minimize risk of & limit on escapes

RIVER/STREAM/LAKE/COAST

Nurturing Green Aquaculture in Myanmar Programme

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Nurturing Green Aquaculture in Myanmar (NGA-Myanmar)

Driving digital green solutions for micro, small and medium enterprises (MSMEs) in Myanmar's aquaculture sector

About us

Village Link is the leading agriculture technology company in Myanmar that prides itself in enabling Myanmar's agricultural and rural communities through the use of mobile technology.

Harnessing advance satellite capabilities, the knowledge pool of agricultural and meteorological experts, and the extensive networks of our business partners, we deliver precision farming advisory and market access to individual smallholders across the country.

What we do

Digital Farm Advisory through Htwet Toe app
Tailor-made farm advisory services for smallholders and agribusinesses

Partnerships
We help agribusinesses, social enterprises, and INGOs with their digital outreach capabilities

Advertisements and e-commerce
We help promote contents and products of agribusinesses to our large user base

Remote sensing data & analysis
We provide key insights which are derived from agri-related satellite data for our business customers

Through NGA-Myanmar Program



Expand to Aquaculture



Promote green practices & techs



Leverage digital platform

Expand services to cater aquaculture enterprises to improve resource efficiency while increasing productivity

Develop a mobile platform for aquaculture enterprises as a one stop solution to adopt green practices and technologies

Partner with other tech providers, financial institutions, off-takers, exporters to link environmental responsibilities with economic returns in the aquaculture sector

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ထွက်တိုး
Htwet Toe
by Village Link

We bundle digital services to support resource efficiency & reduce environmental degradation in aquaculture industry, while ensuring improved economic returns in the value chain.

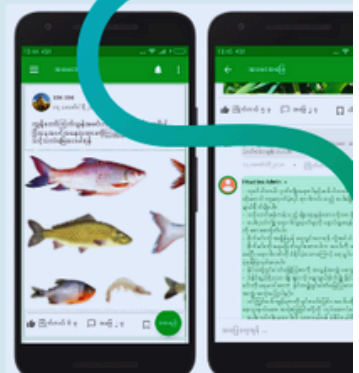
Through the support from the EU-funded NGA-Myanmar program, Htwet Toe app has now been expanded to promote green practices and technologies in aquaculture production.

Basic Services



- **Green Aquaculture Guide**
Technical guides, incl. text, videos and pictures.
Circular bio-economy practices.
Other green practices and technologies.
- **Q&A and Call Center**
Get answers from experts. Call and get instant help.

- **Fish price info**
Check latest fish prices from wholesale dealers.
- **Weather info**
Up to date weather data & forecasts.
- **Marketplace**
Buy and sell of products by producers, input suppliers, etc.
- **Pond diary**
Record keeping made easy. Supported with useful tools (e.g. FCR calculator, etc.)
- **Financial literacy**
Personal, household, business financial management knowledge.



Expanded Services (under development)

- **Smart feeder**
IOT feeding systems, automates fish feeding.
- **Smart feed supply**
Feed supply made easy for producers, in collaborations with feed suppliers.
- **Pond monitoring**
Provides early impact assessment based on key pond parameters.
- **Fish monitoring**
Monitors fish growth stage and damage on large-scale fish growing areas.
- **Weather analytics**
Provides more accurate weather, early warnings of droughts and floods.
- **Know Your Customer & Innovative Credit Scoring**
Assist financial institutions with predictive forecasts for loan origination, credit assurance & sustainability metrics alongside financial returns.
- **Marketplace for green tech**
Bring together green tech providers (e.g. solar tech suppliers), green finance providers & producers to improve adoption of green techs.

