

Offering Partnership & Alliance



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Opal, an aquaculture development centre, is involved in developing aquaculture solution with focus in reproduction, ie producing quality fingerlings (baby fish), a key success factor in fish farming

Also involved in providing relevant support services to grow-out farmers that enhance farm production



Land Size : 0.5 ha (Singapore)

Method : Ras / Aquaponics
(powered by solar-grid hybrid system)

Organisation : SME / Family / Independent

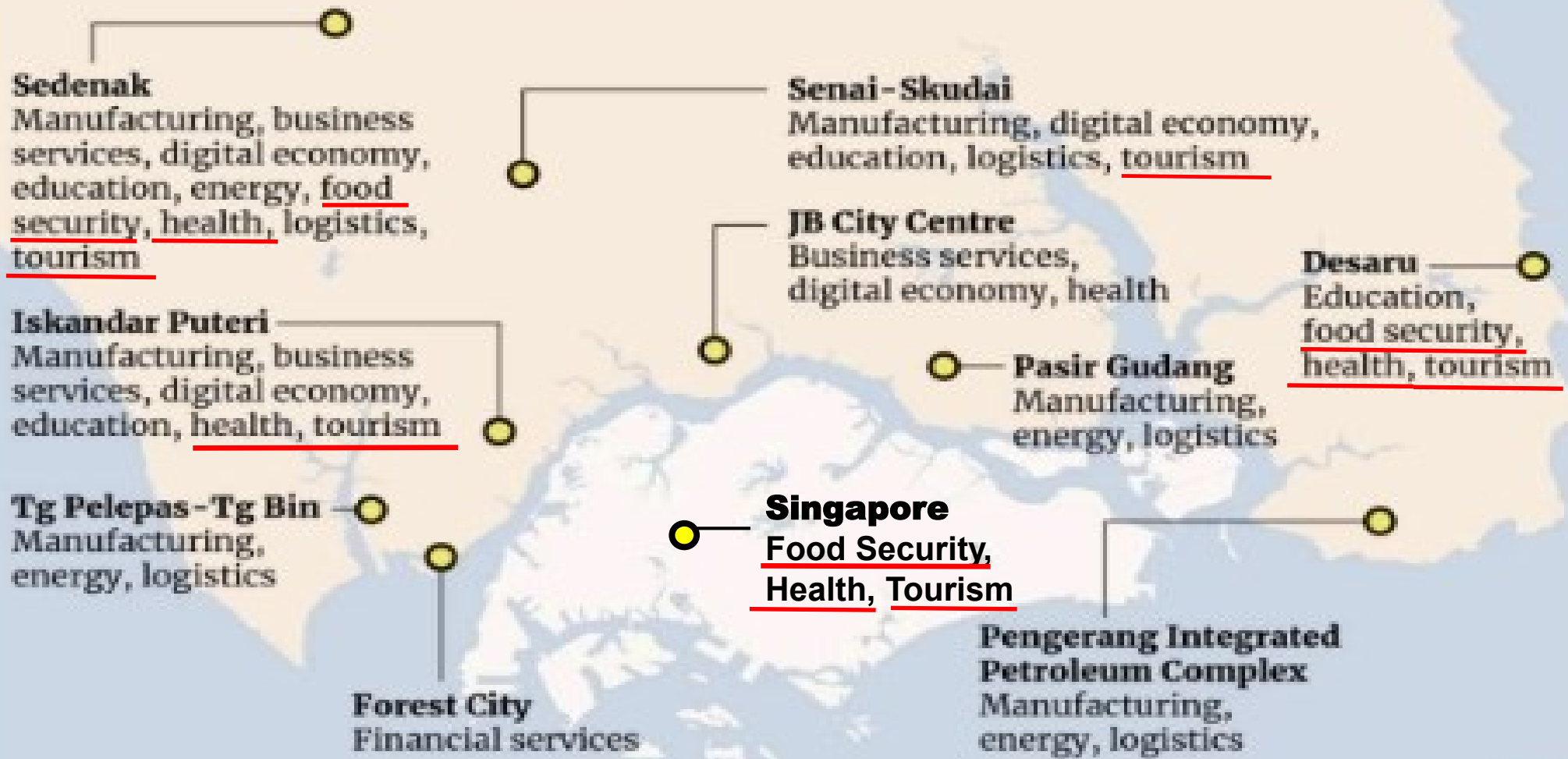
Production : Fish juvenile / fingerlings for supply to grow-out farmers

Services : a) Precision farm management tools
b) Top coating of pellet feeds with functional additives

Commercial Species : Marine Tilapia, Patin, Jade Perch

R&D Partners : Industry collaborator with TLL, NUS & NTU
(TTL- Temasek Life Science Laboratory
NUS- National University of Singapore
NTU- Nanyang Technological University)

Johor-Singapore Special Economic Zone area



Mission:

To build an authentic **farm-to-table** model

Challenges:

Food services face supply inconsistency, high cost and quality issues.
Fish farmers face demand inconsistency and scheduling issues.

Solution:

Co-management among common objectives parties along entire supply chain making the best of readily available facilities & resources for cost-effectiveness with maximum information exchange to achieve effective decision making

Impact to community:

Community growth, local economy, food security

Salient feature of typical farm-to-table model include:

Supported by several small nearby urban farms (instead of large-scale farm)
Close relationship and connection among all parties in the food system
Maximum communication, maximum information flow, maximum sharing
Minimum packaging, minimum transportation, simplified distribution
Food safety traceability

Timely quality supply from each process has big impact to the result of the food system

Brood-stock
Management



Spawning
& Hatching



Nursing to
Fingerlings



Growing to
market-size



Post-harvest
Processing



Food
Processing
& Service



Proprietary
Stock



Intensive
Production



Collaborative
Farming



Community
Growth

Opal spent many years in application research and development for the **entire growth cycle** of selected aquatic species, particularly with focus on **reproduction**.

We supply fingerlings (baby fish) to local and overseas grow-out farmers. Opal's unique **strength** is in its proprietary broodstocks management for the consistent production of quality fast-growing fish fingerling.

Our core species is marine tilapia. We develop our proprietary tilapia brood-stocks via years of time-consuming development supported by suitable technologies and techniques.



Unique marine tilapia strain developed by Opal via a process of in-house hybridization and selective breeding

Packing of fingerlings for delivery to grow-out farms (local & overseas)



Harvesting for immediate delivery to local food services



MARINE TILAPIA (core species)

Opal's unique hybridization technique result in improving fish survival rate and growth rate

Opal's sex-reversal protocol result in fingerlings that have faster growth-rate

Opal has proven track record in the proper utilization of techniques that facilitate consistent weekly supply of affordable & quality fingerlings to grow-out farmers

Opal collaborate with same grow-out farmers for supply of fresh fish to food services



Hatchery Production Standard

OPAL do not import baby fish fry from other parties. Opal depend 100% on its proprietary in-house managed brood-stocks for the production of quality fingerling. Besides, OPAL is able to continuously generate new brood-stock line to replace old expired line. OPAL's unique strategy of consistent fingerling (seed) production allow consistent weekly supply to grow-out farms. In this way, we ensure fish farms' consistent supply of market-size food fish to consumers.

We achieve operational cost-effectiveness and help achieve less GHG emissions by successful implementation of our unique solar-grid hybrid energy system.

We continuously enhance our aquaculture standard by partnering in relevant R&D projects with Temasek Life Science Laboratory, National University of Singapore & Nanyang Technological University.





Opal believe in having the right **resources**, the right **facilities**, the right **people**, the right **techniques**, the right **procedures** for the expected efficiency, cost-effectiveness and customer acceptance



Egg Hatching System

A photograph showing two men loading large, clear plastic bags filled with marine tilapia fingerlings into the open rear hatch of a silver van. The van is parked in a fish farm facility with rows of large blue circular tanks. One man is wearing a red t-shirt with "RESPECT R" on the back, and the other is wearing a red tank top with "YADAO 7" on the back. The scene is outdoors under a covered structure.

Loading marine tilapia fingerlings for delivery

How does Opal facilitate food fish production by farmers ?



Opal Fingerlings Production Capacity (based on existing production)			Potential <u>Yearly</u> Harvest by Tilapia Grow-out Farmers		
Weekly (pieces)	Monthly (pieces)	Yearly (pieces)	Fish av size 500g from 1,800,000 fingerlings	Fish av size 800g from 1,800,000 fingerlings	YEAR TOTAL
			(a)	(b)	
70-100,000	300,000	3,600,000	810 ton *	1,296 ton *	2,106 ton

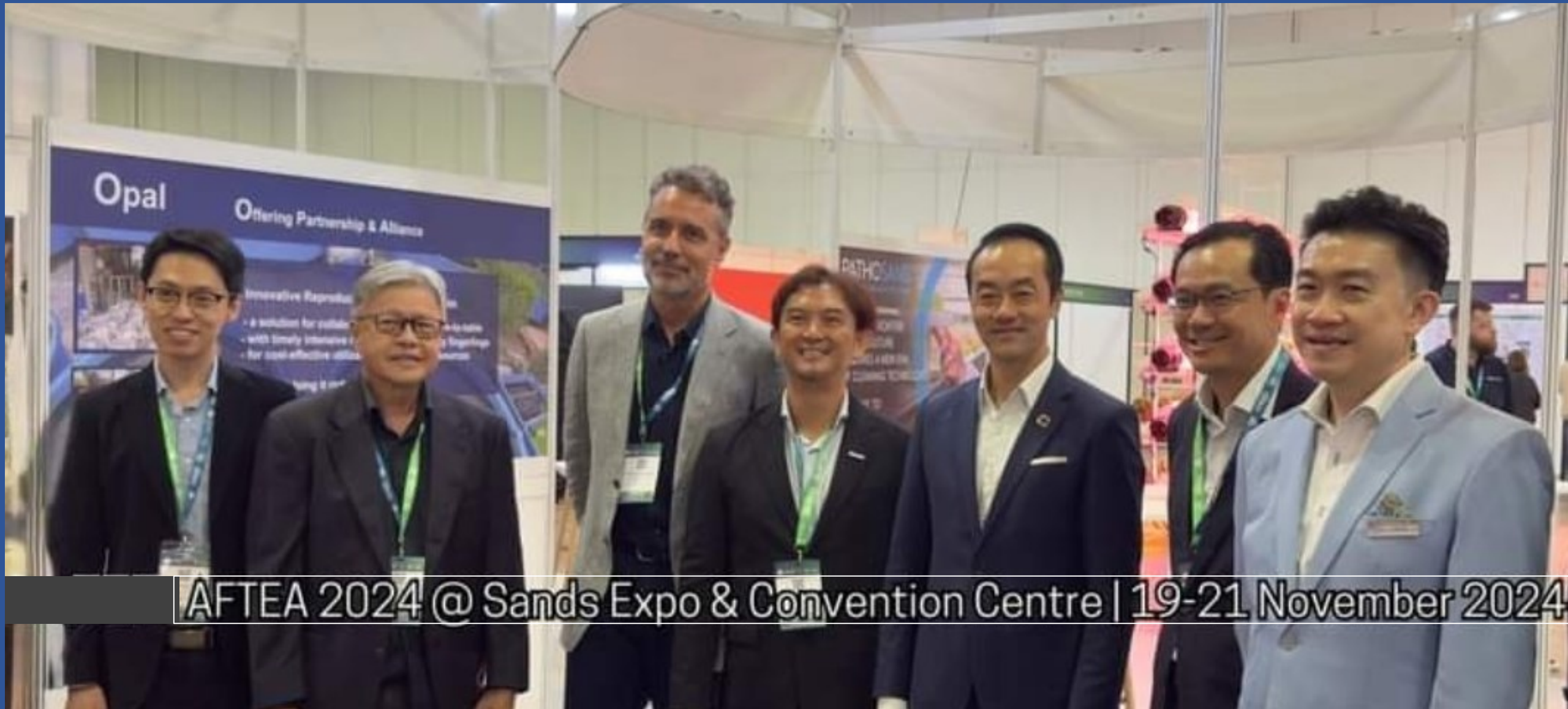
* - assuming 10% mortality

Key Success Factors

- Good husbandry standard including fish health management
- Co-management in supply chain from urban farming to food service (farm-to-table)

Singapore farmer





AFTEA 2024 @ Sands Expo & Convention Centre | 19-21 November 2024

Opal

Offering Partnership & Alliance

Innovative Reproduction of Aquatic Species

- a solution for collaboration in authentic farm-to-table
- with timely intensive reproduction of quality fingerlings
- for cost-effective utilization of available resources

"doing it right, right from start"

Round

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Joint Ventures & Portfolio

CREMER
Sustainable Foods

growthwell

Innovation Park

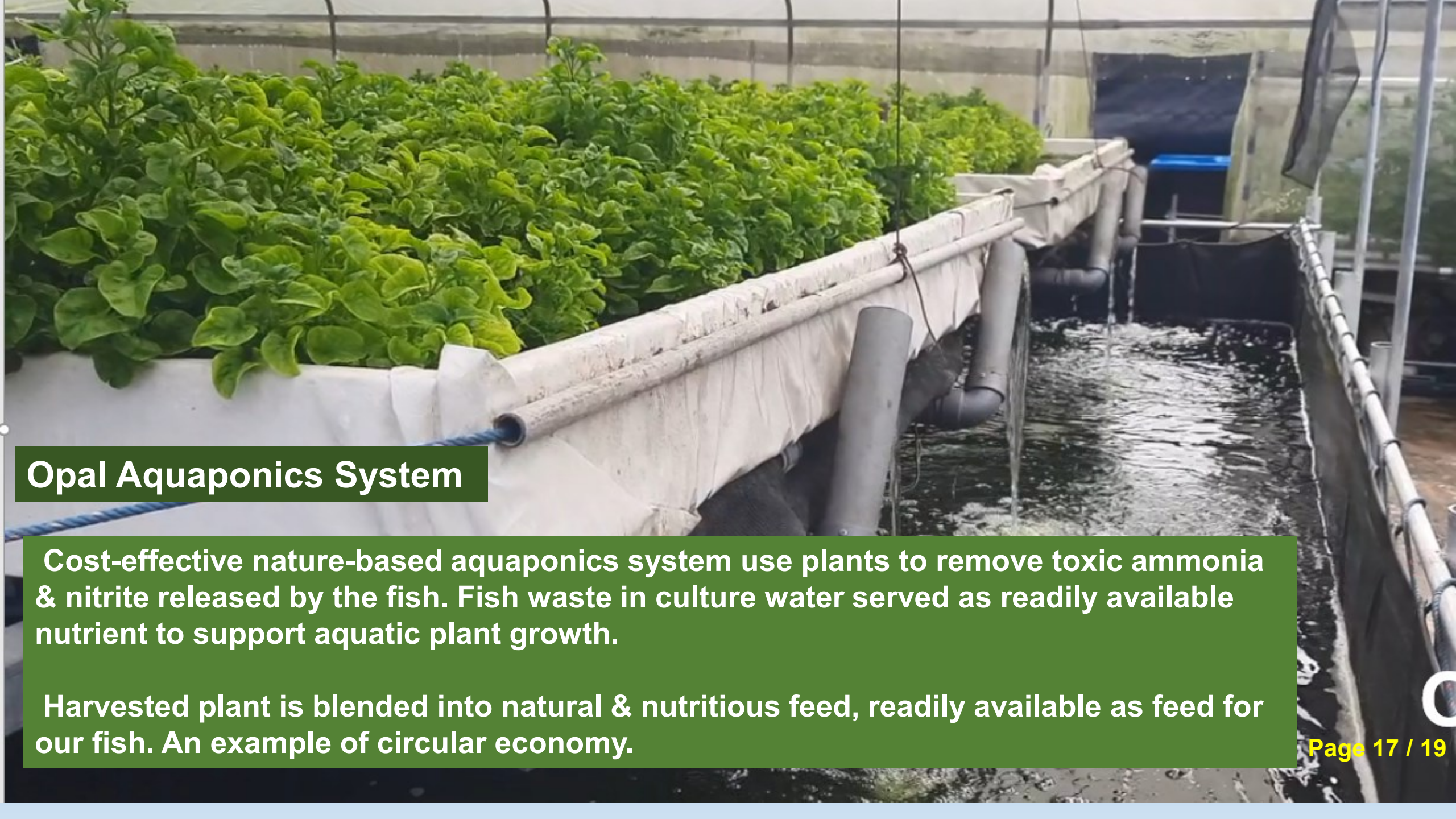
FOOD
FOUR

a

Opal Aquaponics System



Aquaponics is a closed-loop food production system that combines aquaculture (growing fish) and hydroponics (growing plants in water) into one highly efficient, symbiotic environment.



Opal Aquaponics System

Cost-effective nature-based aquaponics system use plants to remove toxic ammonia & nitrite released by the fish. Fish waste in culture water served as readily available nutrient to support aquatic plant growth.

Harvested plant is blended into natural & nutritious feed, readily available as feed for our fish. An example of circular economy.

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Opal



Round Fish Tank

Round Fish Tank





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