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## AQUADAPT:

# Nature-based solutions in the Philippines

Preliminary survey under the IDRC-funded project “Knowledge brokering for nature-based solutions (NbS) in aquaculture transformation in Asia-Pacific: Support to the Aquaculture Innovation and Investment Hub (AIH)”.

The project conducted a preliminary survey of the effectiveness of various types of nature-based solution (NbS) in use in the Philippines that contribute to climate change resilience by enabling off-grid farm operations and reducing reliance on costly fossil fuels, renewable materials and improved designs that enhance efficiency. Aquaculture enterprises were assessed for this project based on the NbS they utilised and the potential benefits they offer in mitigating climate change impacts and enhancing production systems.

Based on BFAR Regional Field Office Submissions, 50 aquaculture innovations nationwide have been identified to date (Table 1). The list will be extended and screened as further regions report, in cooperation with the BFAR National Research Centers.

**Table 1.** Innovations in aquaculture identified in the Philippines by region, as of March 2025.

Region	Innovation in Aquaculture	Species Cultured
<b>NCR</b>	Intensive culture using fiberglass tanks	African Catfish
	Farming using canvas	African Catfish, Tilapia
	Culture using environment-friendly materials for longline method	Green Mussel
	High-Density Polyethylene (HDPE) fish cages	Tilapia
<b>CAR</b>	Aquaponics	African Catfish, Tilapia
	Modified intensive hatchery	Tilapia
	Solar-powered venturi aeration system	African Catfish, Tilapia
<b>R1</b>	Rope-framed cage	Pampano, Siganid, Red Snapper, Seabass
	Culture production using bamboo raft technology	Oyster
<b>R2</b>	Aquashade technology	Tilapia
	HDPE fish cages	Tilapia
<b>R3</b>	Modified intensive hatchery	Tilapia (GET EXCEL)
	Aquashade technology	Tilapia (GET EXCEL)
	Solar-powered aquaponics	African Catfish, Tilapia
	Solar-powered venturi aeration system	Tilapia
	Culture production using bamboo raft technology	Green Mussel
	Fattening in a cage	Lobster
	Pen and cage culture in saline intruded areas	Milkfish
	Super intensive clean water technology	Shrimp
	HDPE floating circular cages	Milkfish
Utilization of algae paste in hatcheries	Milkfish	

<b>R4</b>	Fattening Recirculating Aquaculture System (RAS) facility	Crab
	Modified intensive hatchery	Tilapia
	Biofloc system	Tilapia (Red)
	RAS	Tilapia
	Extruded floating fish feed	Feeds
	HDPE marine fish cages	Fin Fishes
<b>R5</b>	RAS	African Catfish, Tilapia, Mud Crab
<b>R6</b>	Paddle wheel	Shrimp and Milkfish
	Ultraviolet light (UVL) filtration system	Shrimp and Milkfish
	Circulating water temperature control system	Shrimp
	Probiotics	Shrimp
	Pond liner	Shrimp and Milkfish
<b>R8</b>	HDPE pipe frame circular fish cages (submersible)	Milkfish
	Modular HDPE fish cage	Milkfish
	Longline technology (single/modular)	Mussel & Oyster
	Raft culture	Oyster
	Solar-operated puerulus collector	Lobster
	Modified single-floating	Seaweeds
	Fixed-off bottom monoline method	Seaweeds
<b>R10</b>	Broodstock development and improvement	Green Mussel & Perna Viridis
	Aquaculture community participation research	Tilapia
	Artificial egg incubation	Tilapia
<b>R11</b>	Biofloc system	Tilapia
	Eco-solar farm	Shrimp
<b>R12</b>	Registration and accreditation of the grow-out facility expanded	Shrimp
	Continue enhancement/operation of the existing BFAR regional laboratory	Multi-species
	HDPE-lined circular tank	Shrimp
	Fiberglass tank system for nursery and grow-out operation	Catfish
	In a pond raceway system	Tilapia

Source: BFAR RFO Submissions

During the Mid-Project Country Visit by the NACA team, the project team noted some NbS innovations in aquaculture among the farms visited in the CALABARZON Region (Cavite, Laguna, and Batangas) and Region III (Bulacan), as summarized in **Table 2**. It should be noted that this summary doesn't yet include information on GESI (demographic; role of marginalized sector—women, youth, Indigenous peoples; nature-based solutions criteria; and aquaculture transformation). This information will be covered in future data gathering activities pertaining to detailed assessment of the selected innovations, as the project proceeds.

**Table 2.** Farms implementing innovative and nature-based solutions for sustainable production.

Innovation Identified	Name and Address of Company	Description of Innovation	Species Cultured
Paddle wheel, UVL filtration system	CCM Agri Aqua Ventures Corp - Calatagan, Batangas	<ul style="list-style-type: none"> <li>Life support for high stocking density</li> <li>UVL filtration system is used to purify and disinfect the water in the pond</li> </ul>	White leg shrimp - <i>Penaeus vannamei</i>
Recirculating Aquaculture Systems	Highland's Crab - Alfonso, Cavite	<ul style="list-style-type: none"> <li>To ensure a regulated and sustainable environment for high-density fish production, water is continuously filtered, cleaned, and then recycled back to the fish tanks after waste products like sediments and ammonia are removed (FAO, 2015).</li> </ul>	Mud crab
Recirculating Aquaculture Systems - Pinoy Innovating Aquaculture System (RAS-PINAS)	E-Primate Inc. – Sta. Rosa, Laguna and Bustos, Bulacan	<ul style="list-style-type: none"> <li>Localization of RAS design and water management system</li> <li>Application of Strategic Practice of Operation with NbS</li> </ul>	Tilapia
Integrated Multi-Trophic Aquaculture  Automated feeding system	Khay Kim Fishport Complex - Paombong, Bulacan	<ul style="list-style-type: none"> <li>Practices polyculture farming is an ecosystem-based aquaculture through combination of non-competitive fish species from different trophic levels creating a balanced ecosystem and maximizing the feed efficiency in fish pen farming</li> <li>Installation of an automated feeding system to improve feeding efficiency and reduce feed waste in milkfish farming</li> </ul>	Milkfish

Source: Field Visits