

SPECIAL REPORT

Aquaculture seeds and feeds at the core of AQD's collaboration with the Government of the Philippines

SEAFDEC/AQD

For almost 50 years, SEAFDEC/AQD has been generating scientific information behind aquaculture technologies applied in Southeast Asia and other parts of the world. Since 2017, AQD and its host country, Philippines, have upgraded their collaborative programs to accelerate the implementation of projects that address the needs of the local aquaculture industry. A reliable supply of quality seeds and a source of cost-efficient nutrition are at the core of the partnership, these being the most pressing issues faced by fish farmers. In just four years, AQD had made significant headways in providing technical support to the government agencies of Philippines.

Fry sufficiency program

While AQD in the Philippines is the birthplace of milkfish breeding and hatchery technologies, the country is currently in a deficit for fry to supply its large milkfish industry, which is second in the world next to Indonesia. Local hatcheries produce an estimated 1.2 billion fry annually, while upwards of 1.4 billion are imported from abroad. To address this shortage, state-owned multispecies hatcheries are set to be constructed in strategic locations around the country. In 2018, AQD was tasked by the government, through the Bureau of Fisheries and Aquatic Resources (BFAR), to conduct site suitability surveys and design facilities that will each produce about 25 million milkfish fry annually. BFAR provided the support of USD 188,700, with which AQD surveyed 16 towns in eight provinces for possible sites. AQD has so far endorsed the completed feasibility of eight proposed hatchery sites and provided detailed engineering designs for each. Under a separate agreement, AQD is also helping BFAR evaluate proposed hatchery development sites in Western Visayas. These include new locations for proposed hatcheries and existing hatchery sites that are either non-operating or underutilized. So far, the Department has completed feasibility studies for proposed sites in three towns, and two hatcheries are already undergoing rehabilitation.

At AQD's Tigbauan Main Station, new broodstock and multispecies hatchery facilities were also constructed between 2019 and 2021 to help boost fry production. They showcase AQD's design for the hatcheries supported by the government to be built around the country. Besides, training areas were provided in the new facilities to accommodate government personnel and private technicians. Four new broodstock tanks were constructed to hold at least 400 additional milkfish breeders which can produce 256 million larvae annually. These larvae may be supplied to satellite hatcheries that have no broodstock facilities. A new marine fish hatchery was also constructed and can be used to produce a target of 20 million

milkfish fry annually. The same facility can also be used for pompano, mangrove crab, or shrimp. Meanwhile, a freshwater hatchery was also constructed to produce seeds of the giant freshwater prawn, catfish, and tilapia.

Parallel with infrastructure development, AQD also piloted the training of personnel to operate the proposed government hatchery facilities. Two rounds of intensive training in 2018 and 2021 were done for a total of 23 fisheries graduates who were given hands-on experience in AQD facilities. For three months, the trainees helped operate the marine fish hatchery, milkfish hatchery, shrimp hatchery, mangrove crab hatchery, and freshwater hatchery of AQD. They were also given experience in pond and sea cage culture. As early as 2018, a group of trainees already successfully upstarted a BFAR hatchery in the province of Camarines Sur, while some continue to work in AQD while waiting for the completion of the government hatcheries.

Aside from enhancing infrastructure and human resources, AQD also stocked up on milkfish breeders to boost its own capacity to serve as the central hatchery to supply eggs and larvae to satellite hatcheries. Between 2018 and 2021, the Department acquired about 500 breeders, each weighing



One of SEAFDEC/AQD's designs of multispecies hatcheries to be built and operated by the Government of the Philippines

between 3 kg and 5 kg, in addition to its existing stock of about 200 breeders. Most of these were stocked in the new broodstock facilities. To maximize the breeding potential of the milkfish broodstock, AQD implemented a thermal manipulation technology at its broodstock facilities to raise the water temperature from 26 °C to 30 °C. This is to demonstrate a solution to the non-spawning of milkfish during colder months in the country, particularly from November to February. During the test run from November 2019 to February 2020, months when no production is usually observed, almost 24 million good eggs and 12 million normal larvae were produced.

Development of low-cost feeds

With feeds being the largest expense in aquaculture production, AQD has long been developing cost-efficient feed formulations using alternative ingredients such as agro-industrial wastes and byproducts. Using byproducts of poultry and ethanol production as well as protein-enhanced copra meal, AQD formulated a diet that costs only about USD 0.55/kg to produce in its pilot-scale feed mill compared to commercial feed that costs about USD 0.69/kg.

While favorable results in experimental trials have been documented, the efficacy and efficiency of feeds can only be confidently verified through large-scale feed testing. To

achieve this, AQD partnered with the National Fisheries Research and Development Institute (NFRDI) and BFAR to accelerate the push for cost-efficient feeds. Under the USD 145,800 agreement formalized in 2018, AQD, NFRDI, and BFAR have been jointly testing low-cost feed formulations at their respective facilities in the provinces of Iloilo, Guimaras, La Union, Eastern Samar, Batangas, and Nueva Ecija. The broad scope of the field tests covers milkfish and tilapia culture in cages and ponds in freshwater, brackishwater, and, saltwater (except for tilapia). So far, results have been promising with tilapia and milkfish fed with the AQD-formulated feeds performing at par, if not better, than those fed commercial diets in terms of total weight gain, average body weight, total feed consumed, and feed conversion ratio.

With endorsement from BFAR, a fish farmers' cooperative has inked an agreement with AQD for the Department to assist them in building a feed mill in the province of Capiz. The facility will produce feeds using the low-cost formulations of AQD and help provide for the needs of local fish farmers. AQD assisted the farmers in preparing a feasibility study for the proposed feed mill and will continue to assist them until operations are realized. ❖



AQD's new broodstock tank facilities at its Tigbauan Main Station



Stocking new milkfish broodstock at AQD's new facilities at its Tigbauan Main Station



Tilapia harvest during the field testing of cost-efficient feeds at AQD's Dumangas Brackishwater Station