SPECIAL REPORT

Towards Sustainable Mud Crab Farming in the Philippines

By SEAFDEC/AQD

Mud crab research started early at the SEAFDEC/AQD in 1977 followed by intermittent pauses until it resumed in earnest in 1997. First, in collaboration with Australian Centre for International Agricultural Research (ACIAR) with the aim of easing dependence on wild mud crab seed-stock and feed from fish by-catch (trash fish) and to eventually transition to hatchery-produced seed-stock and formulated diets. This was followed by a project funded by the European Union in collaboration with the University of Wales Bangor (U.K.), University of Ghent (Belgium), and Can Tho University (Vietnam). The main objectives were to improve the reliability and economic viability of mud crab hatchery and nursery production for mangrove-pond aquasilviculture production systems and for stock enhancement. The Government of Japan Trust Fund partially funded the study on the domestication of mud crab in 2007 and recently on selective breeding programs.

Sustainable farming approaches for mud crabs using net pens in mangrove areas was developed by SEAFDEC/AQD both to conserve mangrove forests and to expand mud crab production areas. In 1995, SEAFDEC/AQD initiated studies on mud crab culture in mangrove pens in Panay Island. Then trials on mud crab monoculture in tidal flats with existing mangroves were verified in various places in the Philippines. An AQD study was also conducted to evaluate the effects of crab net pen systems on mangrove macroflora, and the replacement of dietary fish by-catch with low-cost pellets.

A decade ago, mud crab farmers in the Philippines were still a little cautious in the use of hatchery produced stock. Their main concerns were: will hatchery-produced crablets be as robust as those sourced from the wild?, will they grow as fast?, and will they be more prone to disease? Recently, however, all these concerns have eased and farmers are now more confident in using hatchery crablets to stock their grow-out ponds or pens.

This transition of the mud crab industry from dependence on wild-sourced mud crab seed stock and wild feed resources of mostly fish by-catch, to hatchery produced seed stock and low cost formulated diets has moved mud crab farming in the Philippines to a more commercial scale. In 2007, SEAFDEC/AQD started a 30-month project on Enhancing the Adoption of Mud Crab Technology in Northern Samar, implemented under the Community Agricultural Technologies Project of ACIAR. The framework was based on the Institutional Capacity Development on Sustainable Aquaculture (ICDSA) of SEAFDEC/AQD where science-based technologies are disseminated to coastal communities, Local Government Units and other stakeholders. Mud crab culture has also been one of the activities promoted under the SEAFDEC/AQD's Agree-Build-Operate-Transfer (ABOT) program, which is meant to disseminate science-based aquaculture technologies to entrepreneurs and fish farmers.

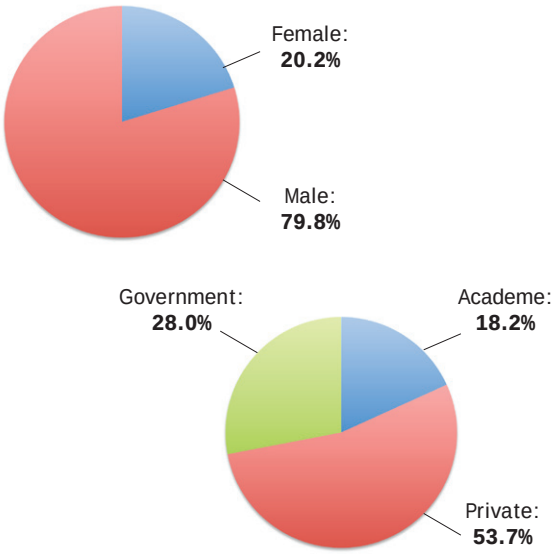
The list of technology adopters and collaborators, both local and international are enumerated at AQD's website, as well as the list of primary scientific publications by AQD researchers. Also available at the SEAFDEC/AQD bookstore are extension manuals on the mud crab written by SEAFDEC/AQD resource persons and scientists. These are: Biology and Hatchery of Mud Crabs *Scylla* spp. by ET Quinitio, FD Parado-Estepa (2008, 2nd edition) 47 pp AEM 34; Mud crab nursery

AQD scientist demonstrating to Timor Leste participants the technique of assessing sexually mature mud crab

in ponds by SEAFDEC/AQD, ACE, MODE/SPPI, BFVMC, ACELT, BFAR, ACIAR/CATP (2010) 27 pp AEM 47; Seed production and grow-out of mud crab (*Scylla paramamosain*) in Vietnam by NC Thach (2009) 29 pp AEM 42; Soft-shell Mud Crab Farming by ET Quinitio and Noe Lwin MM. (2009) 19pp; Nursery and grow-out of mud crab by ET Quinitio, EM Rodríguez and FD Estepa 2009 *In*: Training Handbook on Rural Aquaculture. Chapter 4.4. p. 87-95. SEAFDEC/AQD, Iloilo; and a very informative color poster on the life cycle of mud crab by ET Quinitio that includes an illustrated guide on the identification of the four mud crab species. Science-based technologies developed by SEAFDEC/AQD on the various phases of the mud-crab production cycle are described in detail for hatchery at: *http://www.seafdec.org.ph/?p=5651*; for nursery: *http://www.seafdec.org.ph/?p=5657;* for grow-out in ponds: *http://www.seafdec.org.ph/?p=5670;* and for grow-out in pens: *http://www.seafdec.org.ph/?p=5677*.

Since 2001, SEAFDEC/AQD has conducted training courses on mud crab, *Scylla serrata*. This training aims to provide participants with theoretical knowledge and practical skills in hatchery, nursery, grow-out operations and fattening of the mud crab. The participants are also taught mud crab broodstock management, production and preparation of natural food organisms, feeding, water management, disease prevention, proper harvest and post harvest packing and transport. The trainees are further taught the economics and proper business management on all phases of the mud crab production cycle. They are also made aware of their environmental responsibilities in conserving wild stocks and preserving mangrove areas to ensure the sustainability of the mud crab industry. To date, the Training and Information Division of SEAFDEC/AQD has trained a total of 242

participants, the majority of these came from SEAFDEC Member Countries while some 26 of these participants came from non-Member Countries. In line with the policy of SEAFDEC/AQD on inclusive growth and gender equality, women are well represented in this long-running training program. Below is a graph showing the distribution of training participants based on gender, and on the sectors of society that the participants represent.



Training participants based on gender (top), and sectors (above)

Mud crab aquaculture may indeed be the next sunshine industry especially if some of the existing constraints on its growth are met. Still much work needs to be done to improve production in the various phases of mud crab culture. In the seed production phase, there is a need to develop alternatives to live feeds, improve larval health and increase survival to crablet phase on a consistent basis. In the nursery and grow-out phases, there is a need to reduce cannibalism through improved shelters, continuous harvesting techniques and optimum feeding strategies. Finally, there is a need to develop cost-effective formulated diets through ingredient selection, nutritional requirements studies, pellet size, shape and stability suitable to mud crab feeding habits. All these constraints are being actively addressed by SEAFDEC/AQD researchers and the results of all these efforts will soon put mud crab farming on a more sustainable footing.

International mud crab training: during practical session on ablation and tagging of mud crabs (above) and measuring the carapace length (right)