

Improved hatchery and grow-out technology for marine finfish

Makassar, Indonesia, was host to the annual meeting of the project *Improved hatchery and grow-out technology for marine finfish aquaculture in the Asia-Pacific region*, 22-25 July 2008, organised by the Australian Centre for International Agricultural Research (ACIAR) and the Research Institute for Coastal Aquaculture (RICA) Maros. The meeting was officially opened by the new Director of the Agency for Marine and Fisheries Research, Mr Gelwyn Yusuf and introduced by the new Director for Seed Production in the Directorate-General of Aquaculture, Prof. Ketut Sugama. The objectives of the project are to:

- Improve hatchery production technology for high-value marine finfish addressing larval nutrition and digestion, verification of intensive and semi-intensive hatchery techniques, live prey selection, production of SS-strain rotifers, use of ultra-small copepod nauplii as first feed prey, reducing cannibalism and feed development for late larvae and juveniles.
- Develop cost-effective grow-out diets, including through improved ingredient digestibility, lower cost-feeds, investigation of nutrient requirements, development of low-polluting feeds, commercial testing of feeds and investigation of feed on product quality.
- Facilitate technology adoption, through by identifying constraints and solutions to technology uptake, extension, training, communication and networking.

The project is one of a broader, inter-connected series funded by ACIAR that aims to develop better management practices for marine finfish aquaculture.

Other related projects include:

- Land capability assessment and classification for sustainable pond-based aquaculture systems (FIS/2002/076).
- Planning tools for environmentally sustainable tropical finfish cage culture in Indonesia and northern Australia (FIS/2003/027).
- Improved hatchery and grow-out technology for marine finfish aquaculture in the Asia-Pacific region (FIS/2002/077).

The backyard grouper hatchery technology development facilitated through these ACIAR projects has been widely adopted in Indonesia. In 1999, only five hatcheries in Indonesia produced grouper fingerlings and by 2004 the number had increased to 147. Hatcheries are no longer confined to Bali but have spread across to Lampung, East Java, and new investments in hatchery production are also in development in Riau. The technology was first successful in producing *Cromileptes altivelis* in 1998, followed by *Epinephelus fuscoguttatus* in 2001. Since then this technology has been applied to other marine finfish including grouper species such

as estuary grouper *E. coioides*, *E. polyphemadion*, *E. corallicola*, coral trout *Plectropomus leopardus*, and the golden trevally, *Gnathanodon speciosus*.

The expansion of hatchery production in northern Bali has generated a range of associated employment opportunities for input suppliers. One example is the provision of small 'mysid' shrimp which are harvested from ponds (tambak) in East Java, and transported live in oxygen-filled plastic bags to northern Bali by motor cycle. Project staff report that every morning, a number (<10) of motor cycles transport live mysid shrimp to the Bali hatcheries to provide feed for juvenile groupers.

The simplicity, flexibility and economic viability of the hatchery technology are key factors that have facilitated its uptake and spread within Indonesia. Increasingly, the technology has also been applied in other countries, in part through the Asia-Pacific Marine Finfish Aquaculture Network grouper hatchery production training course conducted annually in Indonesia since 2002. A total of 101 participants from 22 countries have been trained since the course began. The technology is simple and not mechanically complicated so a technician or owner who runs a hatchery does not necessarily need to be highly educated or technically skilled. The flexibility of the technology also enables the hatchery systems to switch between fish species or between fish and shrimp. The low investment and operating costs required enable fishermen or other small players with limited finances to participate in the hatchery business either in the form of employment or by running their own.

The project workshop was followed by a one-day symposium in Bahasa Indonesia to extend the project's research findings to farmers and the private sector, universities and local government officers, and to promote interaction between them. The symposium was attended by a total of 61 people.



Ketut Sugama (left) and Gelwyn Yusuf (right).