Marine finfish section

The Grouper Section has taken on a new and broader name: It has become the Marine finfish Section to take account of other species. This Section is almost wholly based on the Grouper Electronic Network which is prepared by Sih Yang Sim (Editor), Michael Phillips (NACA Environment Specialist) and Mike Rimmer (Principal Fisheries Biologist of the Queensland Department of Primary Industries). Visit www.enaca.org/grouper for more information on the network.

Status of Marine Finfish Aquaculture in Myanmar

U Khin Ko Lay

Director (Aquaculture Division)
Department of Fisheries

Epinephelus areolatus

Myanmar has a long coastal line of 2,832 km stretching from the Nerf River in the North to Victoria point in the South. The coast faces the Indian Ocean in Rakhine State, the Bay of Bengal in Ayeyawady Division, and the Andaman Sea in Taninthayi Division respectively. Such a long stretching coastal areas forms 213,720 square kilometers of continental shelf where the water is fertile and enriched with nutrients and plankton. As the primary production is high, the fisheries resources are turn highly abundant and recognized as one of the richest in the region with great potential to support mariculture.

Current status and species cultured

Fish culture has been practiced since 1950s and nowadays around 45,400 hectares of freshwater fishponds are recorded. However, brackish and marine finfish species are not yet in production on a significant commercial scale. Among marine fin fishes, the indigenous species of sea bass (*Lates calcarifer*) and groupers (*Epinephelus* spp.) are well known and abundant in Myanmar waters along the coast. Since the wild fishes are so abundant there has been little interest in farming until recently. However, recently groupers and seabass become more popular in the fisheries trade due to increasing export demand and people have begun exploring the feasibility of growing these species in suitable areas.

The development of aquaculture is strongly encouraged by the State and a three year plan for the development of finfish culture has been set up since 2000. According to this plan, 26,300 hectares of fishponds will be developed along with nineteen new fisheries stations, including three stations for marine fishes.

The locations of marine fish stations have been designated according to the degree of fish seed demand. At present the station at Chaungtha in Ayeyawady Division is under construction as a prototype. Two other stations are to be constructed at Taungok Township in Rakhine State and at Myeik Township in Taninthayi Division respectively.

Among several indigenous marine species, sea bass, groupers, snapper, and milkfish are potential species for mariculture. Seabass farming in brackish water ponds with juveniles collected from wild has been practiced for years; however, it hasn't reached commercial levels due to imperfect technologies and feeding regimes. Initial experiments have been carried out to produce sea bass seed but the results are not yet significant.

Commercial scale grow out farming of grouper in net cages are being practiced at Kyun Su Township (Myeik area) in

Coral trout - Plectropomus leopardus - photographed at the annual Myanmar Fisheries and Livestock Fair held in February

Taninthayi Division. At present the pioneer farm manage up to 300-350 net cages of 3x3x3 meter size. The most common species are *Epinephalus coioides* and *E. tauvina*. Juveniles are collected from the wild from May through November during lunar periods with a peak catch around full moon. The fishes collected from sites with similar water quality and environment (salinity, water depth, etc) are most preferable for cage culture for good growth and health. Different sized juveniles from 10 cm to 25 cm in are generally stocked. Normally, two types of sizes are differentiated for market; over one kilo size and between 300 gm to one-kilo size. The culture period is 3-12 months to reach marketable size depending on the initial size at stocking. The stocking rate is 800-2,500 fish per cage depending on size and the survival rate is about 30% at harvest.

At Thandwe and Gwa Township, in Rakhine State net cages are constructed for holding groupers of various sizes, which are collected from nearby waters. Fish are fed with small trash fishes for some period until they are strong enough to transport (export) to grow-out farm and restaurants. The most common species in that area is *E. coioides* and commercial levels grow out culture is not practiced yet.

Status of larviculture

Hatchery produced species

A hatchery in Chaungtha at Ayeyawady Division is under construction and it is expected to be operational in 2003. Experiments of induced sea bass breeding were carried out last year with wild caught brood fishes. However, the results were not significant due to imperfect maturity of brood fish and also due to lack of experience.

Wild caught species

Juveniles of sea bass (*Lates calcarifer*) and groupers *Epinephelus* spp. are naturally abundant in coastal area. In the beginning, seabass seed were collected and experimentally raised in earthen ponds. Grouper juveniles mostly *Epinephelus* spp. are collected for marine net cages culture.

Imported species

Recently, seeds of sea bass were initially permitted to be imported so as to encourage and to promote sea bass farming and demonstration purposes.

Prices of various marine finfish fingerling

Grouper fingerlings collected from the wild purposes prevailing price in Myeik area are:

Size	Approximate price
10-12.5 cm (60 gm)	50 Kyats
13-13.5cm (120 gm)	90 Kyats
16-18.5 cm (150gm)	100 kyats
19-21.5 cm (200 gm)	150 Kyats
22-24.5 cm (250 gm)	200 Kyats
25-27.5 cm (300 gm)	300 Kyats

Status of nursery

Regarding the sea bass experimental hatchery program, the nursery phase is critical as the fry are highly carnivorous. High mortality was encountered due to the lack of experience in hatchery and nursery management. Almost 60 % of fry mortality was observed in first 7 days of nursery period whereas mortality during transport was found about 10%. So hatchery, and nursery management techniques are urgently needed for the development of marine finfish culture in the country.

Current grow-out systems and future direction

Cage (various types)

In general, floating net cages are used for groupers culture in Myeik. The sizes of the cage is 3 x 3 x 3 meters and a cluster of cages usually set and stationed by anchored in appropriate site where there is low water current, less wave action and away from the affect of wind direction.

Pond

Small earthen ponds of 0.4 hectare are used for small-scale sea bass farming in Palaw Township, Thanintharyi Division.

Recirculation system

This type of system is not yet used.

Feed used and feeding practices

Locally available trash fish are used as feed. Ground trash fish are fed daily in the morning and evening. In Rakhine State fishes are fed with either trash fish (whole or chopped). Normally, almost 5% of the total fish weight holding in the cages is given as daily ration.

Myanmar's farmers are gaining interest in cage culture systems

Keeping an eye on the stock

Socio-economics, environmental and marketing issues

Fish is one of the major sources of protein for Myanmar people. It is consumed both fresh and processed as dried fish, fish paste, and fish juice. The geographic, environmental, and climatic conditions of the country are favorable to practice aquaculture and capture fisheries. The capture fisheries sector is well developed since the marine and inland fisheries resources are so abundant, the capture fisheries are well developed. Together with freshwater aquaculture the fisheries sector stands in third position in national foreign exchange earnings after the agriculture and forestry sectors. Due to the decline in captures fisheries, a shift to aquaculture is seen as the most effective alternative for sustainable fish production. So aquaculture has become a promising industry and has an important role to elevate the social economy by enhancing job opportunities.

Future development

Species targeted

Among the several marine species, sea bass, grouper, snapper, and milkfish, are potential species for future development.

Other issues

Lack of sufficient seed supply due to lack of technologies and hatchery capacity is the main constraint for the development of marine finfish aquaculture. So, the artificial propagation of marine finfish species and nursery technologies, and facilities as well as capital inputs are urgently required in order to increase the momentum of industry expansion.

Recommendation on future development of marine finfish aquaculture and potential for collaboration

Myanmar is active member of Network of Aquaculture Center for Asia-Pacific (NACA), the Southeast Asia Fishery Development Center (SEAFDEC) and the Association of Southeast Asian Nation (ASEAN). FAO is collaborating with these organizations in the area of regional fisheries development activities and related fields. We acknowledge all of these organizations for their contribution of appropriate assistance and sharing of invaluable experience, which are essential for sustainable mariculture development. In collaboration with regional organizations Myanmar will work to disseminate sustainable aquaculture technologies are to be disseminated among farmers. A core of appropriately trained extensions personnel is required to assist with this work.

Conclusion

There is huge potential for further development in marine finfish culture, which is just initiated in Myanmar. It is envisaged that with a concerted effort by both State and private sectors, mariculture will boom in the very near future. The Department of Fisheries is pursuing mariculture development by providing assistance and dissemination of technology to all fish farmers.

A fish market at Myeik

Mariculture can provide an important alternative or supplemental income for coastal people

Regional Training Course on Grouper Hatchery Production

Bali, Indonesia, 1st–21st May 2003

The second Regional Grouper Hatchery Production Training Course is being organized in Bali, Indonesia, for hatchery operators, technicians and researchers involved in grouper aquaculture hatchery production, research, development and extension.

The training course is organized and supported by the Ministry of Marine Affairs and Fisheries, Indonesia, the Network of Aquaculture Centres in Asia-Pacific (NACA), in cooperation with the Australian Centre for International Agricultural Research (ACIAR), the Asia-Pacific Economic Cooperation (APEC), and the Japan International Cooperation Agency (JICA). It is one of the activities of the Asia-Pacific Marine Finfish Aquaculture Network.

Objective

The objectives of this regional training course are to provide practical hands-on training on the following topics:

- Grouper broodstock management techniques, including handling, feeding, broodstock nutrition, control of the reproductive cycle, spawning techniques and egg collection and incubation.
- Larval rearing, including feeding and hatchery practices.
- Grouper diseases and health management, including viruses (VNN), and common diseases of marine fish.
- Mass production of live food (phyto and zoo-plankton)

The target grouper species for this training course will be mainly on Cromileptes altivelis (mouse grouper), but participants will gain experience with handling Epinephelus fuscoguttatus (tiger grouper) and other marine finfish species.

The training course will provide participants with a unique opportunity to visit private sector hatcheries and nurseries in the Gondol area, and an insight into the diverse mariculture development in Indonesia.

Date and duration

The training course will be held at the RIM-Gondol, Bali, Indonesia, from 1st May to 21st May 2003.

Course Schedule

Participants are expected to arrive in Denpasar, Bali, Indonesia on 30th April 2003. Participants will be picked up in Denpasar airport and transported to RIM Gondol on 30th April 2003, which is a three-hour journey. Participants will return to Denpasar on 22nd May 2003, and should arrange to depart on or after 21st May 2003.

Venue

The training workshop will be conducted at the RIM Gondol in northern Bali, Indonesia, which is equipped with good facilities for training and research activities. RIM has extensive experience in short and long term training for Indonesian farmers and technical staff, in cooperation with JICA. Such activities have contributed to the development of grouper hatchery in Indonesia.

Participants

The training course involves mainly practical hands-on teaching supported by short lectures and workshop discussion sessions. The course is intended for technicians and scientists from the private sector, NGO and government who are actively involved in grouper aquaculture development, research and extension. The participants should have good English proficiency. The training workshop will be conducted in English.

Language

The course will be conducted in English. The local language is Bahasa Indonesia – translations will be provided during visits to private farms.

Resources Speakers and Trainers

Most of the topics will be delivered by the grouper breeding resource persons from RIM-Gondol, supplemented by specialists inputs from elsewhere in Indonesia and JICA expert.

Subjects to be covered

The training course will be involve: 40% lectures and small workshops, 50% practical work in the laboratory and on-station hatcheries and outdoor activities and 10% field trip.

The topics include:

- Management of broodstock
- Management of larval rearing
- Feed and feeding technique for broodstock, larvae and juveniles
- Fish diseases, prevention and control
- Mass production of live food for larvae
- Transportation of seed and broodstock
- Grow-out at floating net cages (brief introduction)

Brief overview of mariculture development in Indonesia

The fieldwork will be conducted around the island of Bali, at small-scale backyard hatcheries and private grouper hatcheries, nurseries, grow-out at northern Bali, and trading facilities at Denpasar.

Certificate of Accomplishment

All participants will be awarded a certificate of completion to certify that each participant has met minimum performance requirements as evaluated by the Resource Persons, the Course Coordinator and the Board of Directors at RIM Gondol. The trainee's performance will be based on his/her participation in class discussions and activities in the laboratory and outdoors.

Application

All participants are required to complete the attached application form and send to the NACA Secretariat, at the address on the form. NACA will then submit the applications to the Director, RIM Gondol for formal acceptance. Selected participants are required to have a valid passport and an entry visa for Indonesia at least for the duration of the training course. Travel documents including passport, visa, fiscal and exit fee are to be arranged by the applicants at their own cost. NACA will assist with visas, if required, in collaboration with RIM Gondol and Indonesian authorities. Application for registration in the training workshop should be sent to the NACA Secretariat by 21st March 2003.

Registration Fee

Qualified participants will be required to pay a course fee of US$1,500. This fee will cover the cost of training materials and supplies, administrative cost and local travel associated with the training.

The costs of accommodation and food will be the responsibility of the participant. At present, only one local hotel is available (see below), but participants will be advised of alternative options that may become available. Booking should be done through the NACA Secretariat.

Accommodation

Accommodation will be at the Celuk Agung Hotel. This pleasant resort hotel is one hour drive from the RIM Gondol. Room rates for an air-conditioned room with hot water are around US$20 including breakfast.

Payment

Registered participants are required to pay the full training course fee US$1,500 by 21st March 2003. After payment if you decided to withdraw for unforeseen reason, we will return 90% of your payment if notice is given prior to 15th April 2003. Bank fees will be born by the withdrawn participant. Payment can be made by either credit card or bank draft (details of payment are shown in the Registration Form).

NACA and the Ministry of Marine Affairs and Fisheries reserve the right to cancel the training course in the event that inadequate numbers of participants enroll, or other reasons beyond the control of the organizers.

Further information, contact:

Mr Sih-Yang SIM
Asia-Pacific Marine Finfish Aquaculture Network
c/o: NACA Secretariat
P.O. Box 1040, Kasetsart Post Office
Bangkok 10903, Thailand
Tel: +66-2-5611728 to 1729 Ext. 120, Fax: +66-2-5611727
E-mail: grouper@enaca.org