SPC PARTICIPATION IN THE
NACA GOVERNING
COUNCIL MEETING,
AQUABUSINESS SEMINAR
AND STUDY TOUR,
MALAYSIA AND THAILAND

Introduction

The Network of Aquaculture Centres in Asia-Pacific (NACA) Governing Council Meeting (GC13) and AquaBusiness Seminar and Exhibit 2002 (AFBiS 2002) were held concurrently at the same venue in Langkawi Island, Kedah, Malaysia. SPC staff members Ben Ponia and Aymeric Desurmont participated in GC13 and in the AFBiS respectively. Mr Maciu Lagiba-lavu was also part of the SPC delegation on a special mission to investigate the issue of NACA membership. The GC13 and AFBiS concluded with a study tour of aquaculture facilities in Southern Thailand. The SPC delegation continued on to Bangkok to the NACA headquarters and to the FAO Asia-Pacific Aquaculture office for discussions.

Thirteenth NACA Governing Council Meeting, Langkawi, Malaysia, 15–18 January 2002

NACA has its origins in the FAO Technical Conference on Aquaculture (1976) which proposed the establishment of regional networks of aquaculture centres in developing regions. The Network has twenty members and participating countries, which account for about 90 per cent of the global aquaculture production by volume. Key countries are China, India, Thailand, and the Philippines.

Mr Pedro Bueno, NACA Director-General, tabled an annual report which outlined the extensive activities of the NACA network, particularly in the areas of training and information. This was followed by reports from the leading regional centres (Integrated Fish Farming, Wuxi, China; Central Institute of Freshwater Aquaculture, India; National Inland Fisheries Institute, Bangkok, Thailand; Aquaculture Southeast Asian Fisheries Development Center (SEAFDEC), Iloilo, Philippines). Other organisations including SPC then presented their activities.

Of the work programmes of NACA, one of the most relevant to SPC is the Aquatic Animal Health Program. Particular relevant aspects of this programme include the proposed expert consultation on legal aspects of aquatic animal health management, the Import Risk Analysis (IRA) workshop, and courses on molluscan health being jointly organised with FAO.

The NACA Regional Information Program also shares many common goals with the SPC. The programme has expanded its scope with the launch of ‘eNACA’, which aims to take advantage of Internet-based communications technology to share information faster and more cheaply. The SPC Aquaculture website currently under construction incorporates many of the same features as the revamped NACA website:

http://www.eNACA.org/

Although the original mandate of NACA was to service the Asia-Pacific region, generally the network has operated exclusively within the Asian area. During the 2nd SPC Heads of Fisheries (HOF) Meeting (July 2002, Noumea), NACA outlined its work programmes and relevant linkages to the Pacific. The HOF delegates subsequently recommended that SPC ‘investigates the costs and benefits of membership of the NACA’.

To conduct this task the SPC enlisted the services of Fiji Director of Fisheries, Mr Maciu Lagibalavu. The GCM provided an ideal opportunity for Mr Lagibalavu and SPC to investigate NACA membership. Consultations were held among NACA officials and NACA’s member countries on the relevant linkages of NACA with the Pacific region.

From these discussions, it emerged that one of the most effective mechanisms for the Pacific Islands to enjoy the benefits of NACA membership is...
through SPC having associate membership with NACA. This would essentially accrue the benefits of membership to Pacific Islands countries while forgoing the fees incurred by direct membership. The provision of associate membership for agencies such as SPC under the NACA Agreement was accepted by the 13th GCM.


The purpose of the Aqua-Business Seminar was to encourage the exchange of information on innovations and technology for aquaculture development between governments and the farming and business sectors. It was attended by more than seventy people, including fish and shrimp farmers, business operators, scientists, technologists, representatives from a few regional governmental agencies, and NGOs, present as observers.

Based on the theme ‘New opportunities for sustainable aquaculture development’, the seminar was organised in five different sessions comprising some 40 topics.

**An overview of the benefits, lessons, and experiences of a regional approach to aquaculture problems**

One of NACA’s objectives was to promote the creation of a regional aquaculture producers’ association that would be formed by the different national producers’ associations. The model of the Federation of European Aquaculture Producers was presented as a possible example to follow. But despite several presentations describing the benefits of approaching problems at a regional level, particularly where environmental monitoring or diseases control are concerned, further discussions showed that the extreme diversity of producers both nationally and throughout the region does not yet allow the creation of such an association. However, it was recommended that NACA be used as a catalyst for the development of such an association and for NACA to gather information on the existing local and national producers’ associations and assist in their strengthening.

**Shrimps, mangrove crabs, and spiny lobsters**

Shrimps are valued as the second most important aquaculture production in Asia. Thailand alone produced 290,000 tonnes of tiger shrimp (Penaeus monodon) in 2001, of which 70–90 per cent were exported for a value of USD 2280 million. However, the rapid expansion of intensive shrimp culture has, in many places, affected the coastal environment, resulting in extensive destruction of mangrove habitats and problems created by the drainage of waste (water and sludge) from farm ponds. Ways to minimise these impacts, such as pond management and closed water systems, were presented.

Methods of producing juvenile mud crabs on a large scale have been developed and tested at SEAFDEC/AQD. While female crabs produce 3–4 million eggs each, the survival rate of juvenile mud crabs is only 1.25 per cent after 45 days. The commercial feasibility of full-cycle crab aquaculture still needs to be demonstrated. Presently, crab farmers in Asia just ‘fatten’ small and soft-shelled crabs captured in the wild.

The culture of spiny lobster (mostly Panulirus versicolor) is being tested in northern Australia with promising results. Lobsters are captured as pueruli (postlarvae) in the wild using crest nets and light cages.

**Disease control, health management, and feed and nutrition**

Disease outbreaks are a major constraint to aquaculture production. Different techniques to deal with this problem were presented to the seminar, ranging from the practice of using vaccines or antibiotics and laboratory monitoring and diagnosis, to good pond or cage management practices. Several speakers emphasised the fact that disease control needs to be approached on a regional basis.

The ‘feed and nutrition’ part of the session essentially provided a forum for industry advertising. An interesting hi-tech system to control the amount and time of feeding in fish cages was presented. As the main feed for aquaculture remains ‘trash fish’ captured from the wild, the setting up of low-cost adapted feeds using other sources of protein is viewed as essential for the future success of aquaculture.

**Promising species, culture systems, species introduction, and movements**

Finfish culture is well developed in Asia, and most presentations concerned marine species. Amongst the ‘promising species’, cobia (Rachycentron canadum) certainly appeared as the hot favourite because it grows 10 kg in the first year and fetches USD 5–8 per kg on the Japanese or Hong Kong fresh fish markets. This species is currently being farmed in Malaysia using ‘Norwegian type’ sea cages (see ‘Study tour’, below). The humpback grouper (Cromileptes altivelis) also has potential
as an aquaculture species. Full-cycle culture has been mastered in Bali and several small-scale commercial farms have entered the production phase. This fish is one of the most valued species on the live fish markets of Hong Kong, Singapore, and China.

Other promising species include the pomfret, the tropical abalone (*Haliotis asinina*) and the Pacific oyster (*Crassostrea gigas*). Johann Bell from ICLARM also made two excellent presentations on the blacklip pearl oysters (*Pinctada margaritifera*) and the sandfish (*Holothuria scabra*). Johann Bell from ICLARM also made two excellent presentations on the blacklip pearl oysters (*Pinctada margaritifera*) and the sandfish (*Holothuria scabra*).

Under the topic of ‘culture systems’, two presentations were of particular interest.

- Ramon Macaraig, from Alcantara and Sons Aquatechnologies Inc., gave a very impressive presentation on their Philippine farm. With 300 ha of ponds, last year the company produced 4300 t of milkfish (*Chanos chanos*), 300 t of shrimps and 600 t of tilapia. They also produced 400 million milkfish fry that they sold to farmers all over Asia. Their farm includes a factory for chilled and processed (boned, filleted, smoked, dried, etc.) products that they export to Asia, the US, South America, and other destinations.

- Jim Smith, from Skretting Australia, gave a presentation on the company’s barramundi (*Lates calcarifer*) farm in Darwin, Northern Australia. Skretting Australia is the second biggest animal feed producer in the world and this farm is their first experiment with tropical fish farming. Skretting Australia used the latest technologies to set up the farm but still had to cope with some local constraints, including crocodiles and sharks. Cages had to be made out of galvanised steel wire, causing real problems with electrolysis and oxidation. Also, by the time the farm reaches full production, it is feared that the barramundi price on the Australian market will have dropped.

**Product quality, trade, and marketing in aquatic products**

Three presentations referred to Hong Kong and China as the best markets for marine finfish, particularly coral reef species. It is interesting to note that in all the presentations referring to Asia during this meeting, the marketing or transport of marine products was never presented as a problem. For example, one presentation described the way in which Malaysia plans to increase its aquaculture production from 167,000 t in 2001 to 600,000 t in 2010. The presentation referred briefly to the way in which the Malaysian government was approaching some of the problems, such as investment schemes, code of conduct, area zoning, environmental factors, fish health and diseases, and the training and education of farmers, but nothing was mentioned about the markets they will be targeting.

**Study tour, 18–20 January 2002**

**Langkawi floating marine cages (Malaysia)**

We could not see much from the Malaysian navy boats that took 70 of us to two ‘Norwegian type’ marine cage farms. However, one of the farmers who was on the boat with us acted as tour guide. The Government of Malaysia actively encourages the development of marine fish farms by providing new farmers with all the equipment they need for four years (including five 50 m grow-out cages, 20 smaller cages for juveniles, nets, and moorings) Farmers are also allowed to use the Fisheries boat to change the nets in their cages once a month and can use

*Fish farmers in Langkawi, Malaysia, are using 'Norwegian type’ marine cages to grow sea bass (*Lates calcarifer*), groupers (*Epinephelus coioides*) or cobia (*Rachycentron canadum*)*[Photo: Aymeric Desurmont]*
the Fisheries facilities to clean and store their spare nets and other equipment. Farmers only need to pay the running costs – mostly fry, fish feed, and employees’ wages. They market their production themselves. It is hoped that, after four years, successful farmers will be able to invest in their own farms, once again with government support. Most farmers would prefer to grow cobia (Rachycentron canadum) or grouper (Epinephelus coioides) but are limited by the availability of fry. For example, cobia fry have to be imported from Taiwan. Sea bass (Lates calcarifer) seems to be the only species for which fry is easy to get (from Thailand).

**Satul Coastal Aquaculture Development Center (Thailand)**

The Government of Thailand is also very supportive of aquaculture development. However in this country, it appears that the industry has developed faster than expected. Government hatcheries are not producing enough fish fry and farmers mostly rely on captures from the wild. Likewise, shrimp (Penaeus monodon) broodstock is still captured from the wild.

The Center has two main facilities that we visited: a big hatchery, based inland, where research as well as production occurs (fry is sold to farmers) and a marine station where the broodstock is kept. Several fish species are bred, including Plectropomus maculatus, Epinephelus coioides, E. lanceolatus, Carangidae, Lutjanus argenti-maculatus, and Cobia. However, the hatchery manager admitted that seabass (Lates calcarifer) is the only species for which they are able to produce big quantities of fry. The Center is also working on winged pearl oysters (Pteria penguin).

*Top: Ben Ponia, SPC Aquaculture Adviser, checking coral grouper (Plectropomus sp.) breeding cages at the Satul Coastal Aquaculture Development Center, Thailand*

*Bottom: ‘Trash fish’, captured from the wild, is the main feed used for grouper cage culture in Thailand*
Satul fish farms

The fish farms at Satul were probably the most impressive part of the study tour. In a mangrove zone at the entrance of the small Satul harbour, dozens of small fish farms line each side of a channel. Farms are made of galvanised pipes or bamboo poles forming squares from which nets are hung to make ‘cages’. Wooden planks are lashed to the pipes and form pathways between the cages. All cages are approximately the same volume of 8 m x 8 m x 4 m deep. One cage holds 500–700 fish.

The smallest farms have three or four cages, while the biggest ones have more than 100 cages. New farmers can get free equipment for three cages from the government to start their operation. Most of the farmers used to be fishers.

The green grouper (Epinephelus coioides) is the preferred species for farming because of the high price it can fetch (USD 8) on the Hong Kong and Singapore markets.

Juveniles 10 cm in length are bought at USD 0.8 each from local fishers and take one year to grow to 1.2 kg. Feed is exclusively ‘trash fish’ (e.g. sardines) bought from local boats or directly fished from the surrounding mangroves by the farmers themselves. With an average of 8 kg of trash fish needed to grow 1 kg of grouper (Mike Rimmer, pers. comm.) it seems that the trash fish species have a dark future in this area.

Another problem is that the very high concentration of farms in these enclosed coastal waters must have an adverse impact on water quality and would make it impossible to control an outbreak of diseases. When you watch fish swimming in these dirty enclosed waters, you realise that ‘fresh fish’ does not necessarily mean ‘healthy fish’.

The National Institute of Coastal Aquaculture (Thailand)

Established in 1981 using a USD 7.5 million grant from Japan, the National Institute of Coastal Aquaculture (NICA) employs more than 200 people, 28 of whom are fisheries biologists. NICA sees its primary responsibility as ‘exploring knowledge of further advancement in the fields of shrimp health, genetic selection, nutrition and feed technology development, coastal environmental protection, and farm management’. Its main objectives are:

1. Basic and applied scientific research on coastal fisheries;
2. Coastal aquaculture development and promotion; and
3. Coastal aquaculture training.

The visit focused on the hatchery, where different broodstocks are kept and used with mixed

Each farm has a small shed, occupying the surface of one cage, where many activities take place: preparing fish feed, repairing cage nets, cooking and surveying the farm at night . . .

[Photo: Aymeric Desurmont]
results. The only species that has been regularly mass produced is the seabass. For other species, including groupers and coral groupers, full-cycle culture has been mastered but the production of fry is too irregular to satisfy the Thai farmers’ demands. The Institute has all the facilities to run training workshops but the language barrier may be a limiting factor since not many Thai people speak English.

The Marine Shrimp Research and Development Center (Thailand)

The Marine Shrimp Research and Development Center has three divisions:

1. Aquaculture Technology and Research;
2. Aquaculture Engineering and Environment Research; and
3. Diseases and Parasites Research.

Lately, it has been addressing the issue of pond waste that has become a major environmental concern in shrimp farm areas. The Center is experimenting with a closed water system, which includes small ponds used as bio-filters and 3 hp pumps used to force air through an array of small PVC pipes set at the bottom of the grow-out ponds. To limit the waste, no fertilisers are used to facilitate plankton blooms and feed is strictly controlled. When the ponds are emptied, the water goes through a series of bio and mechanical filters before being sent back to the ocean. The sludge is left to decay through the action of the sun and bacteria (to accelerate the process, bacteria are taken from the ponds, grown in the lab and sent back to the farm to be dispersed). The system is working and good growth rates have been obtained. The economics, however, still need to be fully assessed.

Cage fish farming in Thailand is a family business, children give a hand after school
[Photo: Aymeric Desurmont]