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 Marine Finfish Aquaculture Newsletter 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 or email sim@enaca.org.

Regional study of seafarming technologies, production trends and market opportunities

NACA has started a cooperation with the Terre des Hommes Foundation-Italy (THF) project in Phanga Nga Bay, Southern Thailand entitled "Children of the Sea – Requalification of Small-scale Fisheries Micro-enterprises and Ecosystem-based Innovation of Aquatic Production Systems for the Sustainable Development of Thai Coastal Communities". The cooperation involves simultaneous studies of seafarming technology and markets in southern Thailand, Bangkok live fish markets and trading networks, regional markets for seafarming products and a status review of regional seafarming production technologies. The emphasis will be on seafarming technologies and commodities that may be important to small-scale fishing communities in Southern Thailand, including an analysis of options for integrated seafarming. The outcome from the studies is expected to be of wider interest to the network, particularly for people working with small-scale fishing communities where there is potential for seafarming. Further information on the project will be made available through a new web site and a report expected to be available in July 2004. In the meantime, further information can be obtained from Paolo Montaldi or Sandro Montaldi at a_montaldi@hotmail.com.

Fish Feed and Feeding

With marine fish farming growing in Asia, there is increasing need to look for better options to reduce the use of wild fish resources to feed groupers and other carnivorous species, and at the least make more efficient use of existing resources. Two reviews have been initiated in 2003, which when completed should provide useful direction for future development of feeds and feeding practices for marine fish in Asia. The first is a study commissioned by ACIAR in Vietnam on so-called feed fish use (definition: feed fish includes all fish used in an unprocessed form as a feed ingredient, either solely or in combination with other ingredients such as rice bran, to feed other animals). The study is showing the importance of feed fish to Vietnam, as the largest fishery in terms of both volume and value. Catches are reported to be increasing, and as in other countries, there is rapidly increasing use of feed fish for aquaculture, although marine fish farming makes up so far only a small proportion of that used. The future planned increases in aquaculture, including a 200,000 tonne target for marine fish, will certainly be constrained by finite sources of feed fish, suggesting an urgent need to stimulate more effective use of these fish feed resources. The second study is an FAO initiative for 5 country reviews of trash fish use in aquaculture, with results expected in 2004. For further information on the ACIAR review, contact Geoff Allan at Geoffrey.Allan@fisheries.nsw.gov.au. Simon Funge-Smith can be contacted at Simon.FungeSmith@fao.org for information on the FAO review. The experiences of the ACIAR project "FIS/97/73 Improved hatchery and grow-out technology for grouper aquaculture in the Asia-Pacific region" in replacement of feed fish in grouper diets are also being summarized into a guidance document, that will be available in early 2004.

Request for information on *Plectropomus*

As reported in a previous issue, some researchers and commercial operators are reporting success with breeding of Plectropomus species. A commercial research and development project in Myanmar is working on red coral grouper (*Plectropomus pessuliferus*). If anyone has any information on this species, the contact email is anawadevi@mptmail.net.mm. The editors would also be interested to hear of other R&D experiences with *Plectropomus* species, please send to grouper@enaca,org and we will include the your experiences in a future newsletter.

Aquaculture Compendium

The response from marine fish network members to assist with the Aquaculture Compendium was very good, and work has now started on several marine fish reviews and species profiles. The web site www.cabicompendium.org/ac/ gives further information on the project.

Live Reef Food Fish Trade Best Practice Standards Review Workshop: WAS Asia Pacific, 26 September 2003

The Live reef Live Reef Food Fish Trade Best Practice Standards being developed by the Marine Aquarium Council (MAC), with various partners, is progressing, and a review workshop

of the latest draft of the aquaculture standards was organised by NACA in association with the WAS Asia Pacific Conference on 26 September. The meeting involved aquaculture specialists from Australia, Thailand, Vietnam, Malaysia and Indonesia, with good attendance from Thai Department of Fisheries staff from all coastal research stations. The workshop participants discussed the draft aquaculture standards, and made suggestions for the different levels of documentation required to support implementation of the standards, as well as raising issues of more general concerning practical implementation of the standards. Particular attention was given to so-called "Level 2 documentation" - Best practice guidance and "Level 3 documentation" - Implementation manuals (or tool kits), and other guidance required to provide practical support to implement the standards/best practice. A further workshop was held in Hong Kong/ Southern China in late 2003. For further information, please contact Peter Scott (P1G1Scott@aol.com)

Pacific Islands: SMART Project to Bring MAC Certification to 10 Countries

The Sustainable Management of the Aquarium Reef Trade (SMART) Project is a two-year MAC initiative to ensure Pacific communities involved in collecting marine ornamentals are part of a responsible trade that contributes to sustainable livelihoods and MAC Certification. The SMART Project will assist communities in ecosystem management plans, responsible collection of aquarium products and market linkages within the added-value context of MAC Certification. The project will also seek to increase the number of MAC Accredited certifiers in the region. The SMART Project will focus on economically disadvantaged coastal fishing communities in the Cook Islands, Federated States of Micronesia, Fiji, Kiribati, Marshall Islands, Palau, Samoa, Solomon Islands, Tonga and Vanuatu. The SMART Project is supported by the European Union. Project partners include the Foundation of the Peoples of the South Pacific (FSPI) and Just World Partners (a United Kingdombased group and FSPI member). FSPI is a network of non-government organizations throughout the Pacific with metropolitan members in the United States, United Kingdom, Australia and elsewhere. For more marine aquarium council news, please visit the MAC web site at www.aquariumcouncil.org.

A Novel Zero Discharge Intensive Seawater Recirculating System for the Culture of Marine Fish, by Ilya Gelfand, Yoram Barak, Ziv Even-Chen, Eddie Cytryn, Jaap Van Rijn, Michael D. Krom, and Amir Neori

Results are presented of a zero-discharge marine recirculating system used for the culture of gilthead seabream Sparus aurata. Operation of the system without any discharge of water and sludge was enabled by recirculation of effluent water through two separate treatment loops, an aerobic trickling filter and a predominantly anoxic sedimentation basin, followed by a fluidized bed reactor. The fish basin was stocked for the first 6 months with red tilapia *Oreochromis niloticus* x *O. aureus* at an initial density of 16 kg/m3. During this period salinity was raised from 0 to 20 ppt. Then, gilthead seabream, stocked at an initial density of 21 kg/ m3, replaced tilapia at day 167 and were cultured for an additional 225 d. Non steady-state inorganic nitrogen transformations occurred as a result of these salinity changes. After day 210, the system operated at all times with those water quality parameters considered critical for successful operation of mariculture systems, within acceptable limits. Thus ammonia, nitrite, and nitrate concentrations did not exceed 1.0-mg total ammonia-N/L, 0.5-mg NO2-N/L and 50-mg NO3-N/L, respectively. Sulfide levels in the fish basin were below detection limits and oxygen > 6 mg/L after the oxygen generator was added at day 315. Ammonia, produced in the fish basin and to a lesser extent in the sedimentation basin, was converted to nitrate in the aerobic trickling filter. Nitrate removal took place in the sedimentation basin and to a lesser extent in the fluidized bed reactor. Sludge, remaining in the sedimentation basin at the end of the experimental period, accounted for 9.2% of the total feed dry matter addition to the system. The system was disease-free for the entire year and fish at harvest were of good quality. Water consumption for production of 1 kg of tilapia was 93 L and 214 L for production of 1 kg of gilthead seabream. Additional growth performance data of gilthead seabream cultured in a similar but larger system are presented. During 164 d of operation of the latter system, maximum stocking densities reached 50 kg/m3 and fish biomass production was 27.7 kg/m3. Relatively poor fish survival and growth resulted from occasional technical failures of this pilot system. The full article is available from Journal of the World Aquaculture Society, Vol. 34, No. 3, September 2003. For further information contact Department of Animal Science, Faculty of Agricultural, Food and Environmental Quality Sciences, The Hebrew University of Jerusalem, Rehovot 76100, Israel.

News from Vietnam

Results released by World Resources Institute in 2002 indicated that Vietnam's coral reefs are among the most threatened in the region. Destructive fishing practices, such as poison and blast fishing threaten as much as 85 percent of Vietnam's reefs while overfishing threatens more than 60 percent of Vietnam's reefs (Reefs at Risk Southeast Asia, 2002). In response to such problems, the Danish International Development Agency (DANIDA) will assist $ 2.7 million to help Vietnam implement the project to support marine reserve area network across the country, according to an agreement signed in Hanoi on December 19, 2003. Fifteen marine reserve areas nationwide are selected for the 2003-06 network support project, which comprises two sub-projects. The first will be implemented in Hanoi with the aim of establishing a consistent system of marine reserve areas and creating a legal framework for the management of those areas. The second, which will be carried out in central Quang Nam province, will support the management of the Cu Lao Cham reserve. The network will help balance marine ecosystems, protect sea biodiversity, regulate environment and

develop sustainable economy, as well as eco-tourism. Vietnam is considered one of the world's most diversified marine-biological centers. Some further background on reefs in Vietnam can be found at www.reefcheck.org/newsletter8/newsletter8.htm

Weekly Average Wholesales Live Marine Fish Prices in Hong Kong

The weekly average wholesales live marine fish prices in Hong Kong's Aberdeen Wholesales Fish Market is available on www.enaca.org/Grouper/FishPrices/FishPricesIndex.htm. The prices are in US$, converted from HK$ to US$ is at 1 HK$ = US$ 0.1282 obtained from the Fish Marketing Organisation (FMO). Further information can be found on the FMO website.

Live Marine Fish Prices at the Huangsha Seafood Wholesales Market, Guangzhou, China – 29-12-2003

NACA staff made a visit to the largest live marine food fish market in China – the Huangsha Live Seafood Wholesales Market – at the end of December 2003. The market sells a wide range of groupers and other coral reef fish from all over the Asia-Pacific region. Information on wholesale prices during December are available (Chinese currency-Yuan, converted to US Dollar with conversion rate of US$1 to Yen is 8.2) at www.enaca.org/Grouper/FishPrices/FishPrices-China-29- Dec-03.htm.

Study Program on Marine Finfish Aquaculture and Markets in Southern China and Hong Kong, July 2004

To provide further insight into marine fish farming and markets in southern China and Hong Kong, NACA will organized a study program to Guangzhou and Hong Kong, China in July 2004. The study program is organized by NACA in cooperation with the Guangdong Dayawan Fishery Development Center (Department of Marine & Aquatic Products, China), Guangdong Provincial Bureau of Ocean and Fisheries, Guangdong Fisheries Society, and the Agriculture, Fisheries and Conservation Department (AFCD) of Hong Kong. More information on this study program will be provided on the marine fish network website in late January 2004 and interested parties please can contact Mr. Sih- Yang Sim (grouper@enaca.org) for further information.

Improving Access to Market Information

In 2004, NACA intends to increase coverage of market prices for marine fish in Asia, for both cultured and capture fish, through a regular e-news. Key informants and information sources are being identified in different export countries and key markets in the Asia-Pacific region. If you are interested to get involved in this initiative, and to share information on marine fish markets and prices, please contact grouper@enaca.org for further information.

The International Seafood Trade: Supporting Sustainable Livelihoods Among Poor Aquatic Resource Users in Asia

The international seafood trade has significant implications for many millions of poor fishers and farmers in developing countries, most recently highlighted by the World Fish Center report (Outlook for Fish to 2020: Meeting Global Demand). Global trade in fisheries products is a multi-billion dollar trade with developing countries in Asia as major stakeholders. Projections are that developing countries will become even more significant suppliers to global seafood trade in the future. Yet, the links between such trade, poverty alleviation and livelihoods of poor aquatic resource users are poorly documented, and ways in which the seafood trade can be oriented towards supporting poverty reduction goals are poorly understood. The implications of moves towards certification, stricter imposition of sanitary and phytosanitary standards and other trade measures are potentially significant for producing countries in Asia, probably impacting on the poorest producers. A new project entitled "The International Seafood Trade: supporting sustainable livelihoods among poor aquatic resource users in Asia" is being implemented with support from the European Community's Poverty Reduction Effectiveness Programme (EC-PREP) (a programme of research supported by the UK Department for International Development (DFID) to enhance the poverty impact of the European Community's development assistance and contribute to achieving the International Development Target of halving the number of people living in extreme poverty by 2015). The project focuses specifically on exports from Asia to the EU of shrimp and coral reef associated fish, principally marine ornamentals, with case studies being conducted in Vietnam, the Philippines and Indonesia. Poseidon Aquatic Resource Management Ltd, the Network of Aquaculture Centres in Asia-Pacific (NACA), and the Support to Regional Aquatic Resources Management (STREAM) Initiative are collaborating to implement the project. The project started with an initial review in October 2003, and will run until to March 2005. Case study field work will be conducted in Vietnam, Indonesia and the Philippines during 2004, and then early in 2005 a final report with recommendations about pro-poor trade mechanisms will be prepared. Case studies on the marine ornamentals trade should generate further understanding of the social implications of the trade, and possible mechanisms to improve social benefits. A web site (linked to www.enaca.org) will be available to provide background information on the project, and reports, from January 2004. The project builds on some of the experiences of the consortium program on shrimp farming and the environment (www.enaca.org/shrimp/) and APEC supported studies of coastal livelihoods and coral reef fish aquaculture (www.streaminitiative.org).

Fish health news

As grouper and marine fish farming starts to expand in the region, there is increasing concern about the spread of serious aquatic animal pathogens. Already, there are reports of VNN and iridovirus being spread around the region due to infected juveniles, causing significant losses on grow out farms, and unknown effects on wild

stocks. Clearly, better management of hatcheries and nurseries will be essential to reduce risks. In response to such problems, the health management components of upcoming NACA courses are being strengthened to emphasise better health management in hatcheries and nurseries. A special workshop "Management of environmental and health risks in marine fish farming" is being planned by NACA in late 2004 to develop some practical guidance on managing of such risks in hatcheries, nurseries and grow-out farms.

Regional Training Course on Grouper Hatchery Production 2004, Bali, Indonesia

The Asia-Pacific Marine Finfish Aquaculture Network and its cooperating partners are planning for the 3rd training course in 2004, the tentative schedule will be from March 24-April 13. As the training course is only taking limited number of participants therefore it is important for those who are interested to contact Mr. Sih-Yang Sim (grouper@enaca.org) to register their interest and secure a place in the training course. The training course reports for 2002 and 2003 are available from the NACA website http://www.enaca.org.

Update on 2003 Training Course Participants

Dr. Trevor Anderson from GFB Fisheries Ltd, Australia successfully produced some 20,000 *Cromileptes altivelis* fingerlings in November 2003, with success also extended to *E. coioides* in his hatchery. Mr. Sufian B. Mustafa from the Marine Finfish Production and Research Centre, Malaysia reported some success in spawning (*Epinephelus* species) after implementing pellet LHRH hormone implantation for broodstock. However, he reports larviculture problems, constrained by lack of S and SS-rotifer. Dr. K. Kailasam from the Central Institute of Brackishwater Aquaculture, India has seen improvement in grouper (*Epinephelus coioides*) breeding with successful female fish spawned and fertilized by stripping method. But larvae did not survive beyond day 7.

Notes from the Publisher

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national R and D institutions and invites experts from other countries to provide technical advice on a range of issues including taxonomy and processing. Sri Lanka's Ornamental Fish Producers Association works with national technical and economic agencies and also engages professionals and scientists, and fosters relationships with similar associations in other countries. The Vietnamese fishery society – a vast well-organized and powerful multi-stakeholder entity - includes in its agenda building links and collaborating with national, regional and international organizations and other NGOs to share experiences and information. Its biennial fishery exhibition and technical conference brings in the participation of policy makers, scientists, technicians, farmers, input supply companies and technical advisers.

Included in the survey are the village farmers associations in Eastern India (where STREAM and other international agencies have been operating). The village associations have realized that maintaining relationships with the NGOs and state and federal government agencies, and continuing their participation in community development activities can sustain the build up of their capacities. A recent move is to provide support for networking the various village associations to facilitate exchange of information among them. Networking builds up numbers. More importantly it broadens the scope of the associations' influence through their alliance fostered by networking.

Holding on to members and staying financially stable are, for obvious reasons, the foremost organizational concerns of farmers associations in developing countries. Other than being able to serve members' needs, being able to sell their produce at a profit is still their best bet to staying viable, relevant and cohesive. The national associations based on a single export commodity (almost all producers associations are organized around a single commodity) are dependent on the market and, on top of coping with risks posed by vagaries of nature and markets, must comply with an increasing number and stringency of "market requirements." They have shown that they are willing to comply with requirements - including those that ask them to be environmentally responsible, to assure that food safety and quality are of a certain standard – as well as to work with government and other sectors on legislation, policies, and standards, and to promote and apply codes of practices and conduct among their members.

Pragmatically, they know that environmentally sensitive and socially responsible farming makes good business sense. However, to the small farmers, or even large but unorganized farmers, some elements of the "market requirements" can be a threat to their staying in business. This is a strong reason to organize to attain economy of scale, and more importantly, to attain a degree of authority to be able to negotiate from a position of strength. Being able to negotiate effectively - for favorable prices and terms for their product and for input supplies and equipment, for better allocation of or access to land, water and credit resources to the industry, for favorable tax structures and other incentives, for access to technology, for improvement of the marketing infrastructure and system, for fairer trade regimes, etc – is probably the best way farmers' organizations can serve their members.

While maintaining viability is a primordial concern, the association should have the ability to work with government and other sectors of society to shape policies and research and development agenda, precisely define its needs and work with others to meet those needs, bring professional and scientific advice into the discussions and decision processes (as the Federation of European Aquaculturists or FEAP does with great effectiveness), and engage in mutually beneficial alliances.

It is clear that to develop the potentials of farmers organizations for sustainable development, it would be best to provide them the environment and motivations to attain a status of authoritativeness.