



A regional response to aquatic invasive alien species

The workshop on *Building capacity to combat impacts of aquatic invasive alien species and associated trans-boundary pathogens in ASEAN countries* was held in Penang, Malaysia, on the 12th-16th July 2004. The workshop was hosted by the Department of Fisheries of the Government of Malaysia and organized by NACA in collaboration with ASEAN, FAO, the WorldFish Center. It was supported by the United States Department of State. The 75 participants included delegates from each ASEAN member country, resource persons with experience in aquatic invasive alien species (IAS) and aquatic animal disease and representatives of regional and international organizations, research institutes, universities and private sector entities.

The project generally supports the ASEAN 2020 Vision of enhancing “food security and international competitiveness of food, agricultural and forest products and to make ASEAN a leading producer of these products...”. It was convened specifically to better understand the relationship of aquatic IAS and pathogens and their impacts (both positive and negative), as well as identify management and capacity building needs to reduce risks.

The workshop built on the recommendations from a 2002 Bangkok workshop organized by the Global Invasive Species Program (GISP) and a 2003 workshop of countries sharing the Mekong watershed, particularly in promoting awareness, establishing coordination mechanisms and information exchange systems and



Participants in the aquatic alien species workshop held in Penang.

identifying management strategies and risk mitigation measures for aquatic IAS.

Findings

The workshop concluded that aquatic IAS and associated pathogens have a significant impact on ASEAN aquaculture with negative implications for aquatic biodiversity, and the social and economic well-being of people in the region. Aquatic animal pathogens have caused severe damage to aquaculture industries in ASEAN. The workshop also recognized the positive social and economic benefits from the introduction and farming of some alien aquatic species in the region. The way forward is to minimize the risks and costs associated with negative impacts of aquatic IAS and aquatic animal pathogens whilst capturing the potential social and economic benefits through responsible aquaculture of alien species.

A website has been established to organize information on impacts of alien species, visit: <http://www.aapqis.org/ias/home.html>.

Recommendations

Four working groups prepared detailed action plans to assess and manage the impacts and risks from aquatic IAS and associated animal pathogens. The following highlights the main recommendations and Way Forward as agreed by workshop participants:

1. Management of aquatic IAS and associated pathogens is imperative in the ASEAN region, and should be enforced by all countries of the region.
2. National strategies should be developed consistent with obligations under existing international treaties and instruments and in harmony with strategies for other IAS, including aquatic plants and ornamental fish. National strategies, coordinated through national focal points, should be based on impact assessment and management of alien species, where they are already established, and use of ecological and environmental risk analysis for proposed new introductions.

3. National strategies should be implemented within a legitimate regional framework supported and endorsed by ASEAN. The working group recommendations and this Way Forward document should be presented to the ASEAN Secretariat as a starting point for coordinated regional action, through the ASEAN Sectoral Working Group on Fisheries and other appropriate bodies.
4. ASEAN member countries should have the necessary institutional and human resources to adopt a harmonized regional strategy. Bridging development gaps and capacity building across member countries is therefore necessary. Special attention should be given to capacity building among the Mekong basin countries of Cambodia, Lao PDR, Myanmar and Vietnam.
5. In-country IAS impact assessments and risk analysis should be promoted in all ASEAN countries. Training in risk analysis should be put into action and the experiences in risk analysis should be shared among ASEAN countries.
6. Further assistance should be provided by regional and international organizations, including the organizers and participants of this workshop, to support ASEAN countries in implementing the recommendations. Networking, information accessibility and exchange and cooperation among concerned agencies, industry, trading partners and countries sharing common watersheds or waterways is recommended for cost-effective use of resources in support of ASEAN in achieving the goal of effective management of aquatic IAS and associated aquatic animal pathogens.
7. Progress in implementing the workshop recommendations should be assessed.

6th Symposium on Diseases in Asian Aquaculture

The theme of the sixth Diseases in Asian Aquaculture (DAA) symposium is *Aquatic Animal Health – Facing New Challenges*. A workshop, a training course, an expert consultation and the 7th Triennial General Meeting of the Fish Health Section of the Asian Fisheries Society will be held in conjunction. The date is to be advised, but it will be in Sri Lanka in late 2005.

Five previous Symposia (Bali – 1990, Phuket – 1993, Bangkok – 1996, Cebu – 1999 and Brisbane – 2002), each brought together more than 200 aquatic animal health scientists, students, government researchers and industry personnel from some 30 countries to discuss disease-related problems affecting aquaculture production and to find solutions for them. Send expressions of interest to participate or request for inclusion in the mailing list to Dr. Melba B. Reantaso at Melba.Reantaso@fao.org using the subject: DAA VI. Visit the FHS website for more detailed information about the society and DAA: <http://afs-fhs.seafdec.org.ph/>

Indonesia Plan EC PREP Seafood Trade Study

NACA and STREAM have completed a planning meeting for ECPREP held in Bali, Indonesia, 24-26 August attended by representatives from Bali, Java and Sulawesi and resource persons from Cambodia, Philippines and Indonesia. Plans include details of the data required, on-site community studies, the selection of study sites, the development of further detailed plans, the formulation of guiding questions to be addressed by the livelihood analysis, including the selection and pre-testing of the appropriate methodology and tools.

The project is concerned with examining the international seafood trade, especially its capacity for supporting sustainable livelihoods among poor aquatic resource users in Indonesia, Vietnam and the Philippines. Partners include Poseidon Aquatic Resource Management Limited, Lymington, Hants, UK, the Network of Aquaculture Centres in Asia-Pacific (NACA) and the STREAM Initiative.

NACA website: Guide to member services

The new NACA website has many new services that can help you to find information, automatically track issues, publish your own news and network with your colleagues all over the world. These services include:

- Personal website account and listing in the Member Directory
- Notifications system (automatic issue tracking and email alerts)
- Discussion forums where you can consult your colleagues working across Asia
- Personal messaging between members
- Ability to post comments on news stories, downloads and other items

- Ability to submit your own news and events for publication on the website.

The Secretariat has published a short guide that explains how to use these free member services to maximum advantage and how to collaborate with your colleagues online. Our goal is to establish an 'Online Community' where you can discuss issues and share information with your colleagues working in other countries. Please note that you must register as a Member of the website in order to use these services (it is free). You can download the guide from: <http://www.enaca.org/modules/mydownloads/viewcat.php?cid=113>

Preparing and responding to health emergencies

Rural livelihoods have been repeatedly put in extreme jeopardy by sudden and severe outbreaks of fish diseases in Asia. Drawing from past lessons and ongoing work in the region, the outcomes of the workshop, held in Jakarta, 21-23 September 2004, will help develop national responses and a regional strategy to deal with aquatic animal health situations.

On past outbreaks

The spread of aquatic animal disease is an increasingly common event in Asia. We have witnessed devastating impacts of Epizootic Ulcerative Syndrome (EUS) in freshwater fish during the 1980s and the 1990s; Viral Nervous Necrosis (VNN) in marine fish since 1990s; White Spot Syndrome Virus (WSSV) in penaeid shrimps from early 1990s to-date; and the emerging Taura Syndrome Virus (TSV) in *Penaeus vannamei*. There are still a number of unresolved diseases such as akoya pearl oyster mortalities in Japan and abalone mortalities in China. Indonesia is currently faced with a serious epizootic, possibly Koi Herpes Virus (KHV), causing large-scale mortalities with significant economic losses, among cultured common and koi carp *Cyprinus carpio* populations, beginning early 2002 until present. More recently, during last quarter of 2003 an outbreak of KHV also occurred in common carp and koi carp in Japan. Many countries in the Asia-Pacific have, thus, to various degrees suffered the consequences of disease outbreaks.

These outbreaks reveal the vulnerability of aquaculture and wild resource production to wide scale infectious disease emergencies and the significant impacts that new diseases can have on local economies. Unless appropriate health management and biosecurity measures are in place and effectively implemented, the risks of



Left to right: Mr Pedro Bueno, NACA DG; Dr Fatuchri Sukadi, DG Directorate of Aquaculture, Indonesia; Dr Rokhmin Dahuri, then Minister for Marine Affairs and Fisheries; Dr Rohana Subasinghe, FAO, Rome; Mr Tsukasa Kimoto, FAO Representative, Indonesia; and Dr Darnas Dana, Director of Fish Health and Environment, Directorate of Aquaculture.

major disease incursions and newly emerging diseases will continue to threaten the sector. Hopefully, past experiences with disease epizootics will provide useful lessons towards better preparedness and faster and more organized responses to similar events when they occur.

With KHV, affected species are widely traded within and between countries in the region and outside, and therefore pose a considerable risk of a trans-boundary epizootic. Common carp is an important food fish and koi carps a high-value ornamental fish. Many rural communities in Indonesia and neighboring countries depend on these species to support their livelihoods. Effective prevention and control measures complemented by extension, educational programmes and capacity building for farmers/producers are essential to reduce the risk of this disease moving within countries and across borders. A strong national approach along with a well-planned regional strategy is required to ensure the operational capability is in place to effectively respond to disease emergencies. Equally important is a clear understanding by

both governments and industry of the benefits from investing and participating in emergency response systems.

The capacity for early detection and effective response to disease emergencies is inadequate in many countries in Asia due to several factors: i.e. limited diagnostic capacities, lack of information, insufficient human resources and infrastructure, and lack of financial resources. Limited understanding of the gravity of the problem often results in failure to provide priority action at national and regional levels. This urgently needs rectifying to avoid further introduction of exotic pathogens and spread of emerging diseases. KHV is a prime example, requiring immediate attention from relevant international research and development agencies, as well as the private sector. Concerted action is essential for controlling this serious epizootic and to regain both consumer and producer confidence.

The workshop

In order to review and evaluate the national and regional status on emergency preparedness and response to infectious diseases in aquatic animals, and to find avenues for providing guidance and assistance for national and regional improvements, FAO in partnership with the Government of Indonesia, NACA and the WorldFish Centre (WFC) organized a workshop entitled *Emergency Preparedness and Response to Aquatic Animal Diseases in Asia*. The Workshop was intended to assist Indonesia and countries of the Asian region in: (i) identifying actions to reduce the impacts of KHV on aquaculture and small-scale fisheries; and (ii) strengthening preparedness and response to serious aquatic animal disease emergencies. It was attended by experts and policy personnel from the region who are responsible for handling health and disease situations in aquatic and terrestrial environments.

Working groups discussed four major thematic areas within the broad theme of contingency planning and emergency preparedness and response, including: Risk analysis and prevention strategies; early warning, early reaction and contingency planning; control and eradication procedures/campaign; and organizational arrangements, support plans, training and capacity building.

Key points discussed and recommendations given are highlighted below:

- While national agencies have the primary responsibility for responding to disease emergencies, regional cooperation can provide essential support. Collaboration exists in aquatic animal disease control in Asia that has helped in responding to emergency aquatic animal disease outbreaks. These existing structures should be used to further strengthen cooperation to support national efforts to control serious aquatic animal disease outbreaks.

- There is a reporting system for aquatic animal diseases in Asia, organized by NACA/OIE/FAO. This reporting system, and the communication networks that support it at national and regional levels, should be further strengthened.
- Reporting of aquatic animal diseases involves fisheries and veterinary authorities. Veterinary authorities have responsibility for official communication to OIE on livestock and aquatic animal diseases that are important for international trade. As most veterinary authorities in Asia have limited experience of aquatic animal diseases, communication between fishery and veterinary authorities should be strengthened.
- Collaboration between countries on prevention of spread of aquatic animal diseases, particularly when sharing common borders and watersheds such as the Mekong basin, is also recommended for emergencies.
- Resource centres with specialist diagnostic skills are required to provide technical support for assisting countries deal with specialist aquatic animal disease problems.
- The further development of the resource centres and expert network of NACA is recommended to support harmonization among countries in diagnostics and upgrading skills.
- Collaboration and communication among countries should be promoted to ensure the needs of the region are taken into account in international standard setting and notification of disease. It is important for the region to be more active in getting information on regionally important aquatic animal diseases into the OIE standards.
- Collaborative research should be encouraged to understand and respond to significant and emerging diseases in the region. Involve the private sector since they are also part of networks.
- Joint activities between countries for testing of emergency response

and regular meetings between countries and exchange of expertise should be encouraged. Regional training on emergency preparedness is recommended

- The region needs resources to draw on in emergencies. Core funding should be allocated to NACA to provide ready resources to respond rapidly to emergencies. Donors should be approached to provide support.

The workshop proceedings, including all technical presentations, recommendations of the workshop and the Asia strategy and action plan will be edited by the Secretariat for publication as a joint FAO/GOI/NACA/WorldFish Centre publication.

New publication ! Marine Finfish Aquaculture Network Magazine

A new full-colour magazine is available, dedicated exclusively to marine finfish aquaculture ! This issue focuses on markets, trade and economic issues.

Best of all, it's free ! You can download your copy from the MFAN website: www.enaca.org/marinefish.

Selected stories from the eMagazine are also reproduced in the printed version of Aquaculture Asia Magazine.



STREAM Agreement with the MoF Vietnam on Communications

The Ministry of Fisheries, Vietnam and the NACA STREAM Initiative have agreed to develop a communications strategy in support of poverty alleviation through fisheries and aquaculture.

The agreement follows meetings held on the 26th and 27th of July 2004 in the Vietnam Ministry of Fisheries, between Dr Nguyen Viet Thang, the Vice Minister of Fisheries (MOFI), Dr Vu Van Trieu, the Director of MOFI International Cooperation Department, Mr Nguyen Duy Vinh, Senior Officer of MOFI Planning and Finance Department, Mr Nguyen Van Dai, Senior Officer of MOFI Aquaculture Department, Mr Tran Van Quynh, the Director of MOFI National Fisheries Extension Center (NAFEC), Mr Nguyen Huy Dien, the Vice Director of NAFEC, Mr Bui Van Thuong, the

Vice Secretary General of Vietnam Fisheries Society (VINAFIS), Dr Le Thanh Luu, the Director of Research Institute for Aquaculture No.1, and Dr Graham Haylor, Director of STREAM.

The agreement is in accordance with the Partnership Agreement, signed between MOFI and STREAM in 2001, where the parties agreed to work towards a better understanding of the livelihoods of poor aquatic resource users, to build institutions and policies to support their needs and to support improved communications; and, consistent with the STREAM Vietnam Country Strategy Paper completed in 2004, the agreement includes:

- MOFI and STREAM agree to jointly develop and pilot a Communications Strategy in support of poverty alleviation through fisheries and aquaculture.

- STREAM will seek donors support for the process.
- MOFI is committed to mobilize Government funds for cost-sharing of this process.
- A Communications Strategy and Monitoring and Evaluation Working Group will oversee this process

The Communications Strategy aims to involve and build capacity of a wide range of stakeholders in the fisheries sector working towards poverty alleviation. It will comprise means of information sharing and include mechanisms for monitoring, evaluation and lesson learning. The overall objective is to increase co-ordination and extend the reach of information exchange in order to better support the needs of poor people who manage aquatic resources.

STREAM Agreement with NAFEC Vietnam on Livelihoods Approaches

The Ministry of Fisheries National Extension Centre (NAFEC) Vietnam and the NACA STREAM Initiative recently signed an agreement to use livelihood approaches in support of the optimal use of available aquatic resources and to reduce vulnerability in selected pilot communes.

The agreement follows discussions held between Dr Nguyen Viet Thang, the Vice Minister of Fisheries (MOFI), Dr Vu Van Trieu, the Director of International Cooperation Department, MOFI, Mr Tran Van Quynh, the Director of National Fisheries Extension Center (NAFEC), Mr Nguyen Huy Dien, the Vice Director of NAFEC and Dr Graham Haylor, the Director of the NACA STREAM Initiative on 26 and 27 July 2004.

It was agreed by MOFI, NAFEC and STREAM to follow up with extension support, the livelihoods studies conducted by the STREAM Initiative in communes of Quang Tri, Long An

and Thai Nguyen provinces with simple but effective technical options, to support optimal aquatic resources use in order to reduce vulnerability amongst poor families in these pilot communes.

The following specific agreements were reached:

- NAFEC would address the bi-annual meeting of the Provincial Fisheries Extension Officers in Can Tho on 29-30 July 2004 highlighting the plan for NAFEC with STREAM to return to the six communes that had formed the basis of the livelihoods study pilot to identify how to carry forwards appropriate livelihoods options with NAFEC support.
- STREAM Vietnam will make available to communes and the provincial extension staff the Vietnamese versions of the livelihoods studies. NAFEC will support STREAM Vietnam to meet with local governments

together and fisheries services in Quang Tri, Long An and Thai Nguyen, to discuss how to move forwards with implementing support for aquatic resources management for poor people.

- It is expected that around 10 families might be accommodated in each commune by this pilot process that could support training, technical extension and contribute to actual start up input costs.
- Lessons learnt from these interventions would be monitored with the support of STREAM and Better-Practice Guidelines would be developed in Vietnamese and English relating the livelihoods analysis and approach.

NAFEC hopes that this livelihoods focused approach would become a model for provincial extension in Vietnam.

NACA-NACEE Cooperation

Several representatives of the institutional members of the Network of Aquaculture Centres in Central and Eastern Europe met in Wierzba, Poland in June 2004 (in conjunction with the EIFAC conference on partnership between science and farmers) to plan for the formal organizational meeting scheduled to be held in November this year in Hungary. Dr Laszlo Varadi, Director of HAKI, who currently serves as the Coordinator of NACEE (and the convener of the EIFAC conference) invited NACA's Director General, Pedro Bueno, to the Wierzba meeting and the two discussed possible areas for NACA-NACEE collaboration. NACA's DG was a speaker at the conference and was coming from a visit of HAKI, Hungary's Research Center for Fisheries, Aquaculture and Irrigation in Szarvas. HAKI is a collaborating centre of NACA. It has been operating in a number of NACA countries implementing EC-assisted and Hungarian technical cooperation projects. It is also one of the members of NACEE.

Dr Varadi pointed out the strong need for improving the co-operation and networking at the institutions of the region so that when the idea of creating NACEE emerged during the work of the EAS Eastern European Committee, the reactions were very positive, and 25 institutions from 13 countries formally established the network at a meeting in HAKI in November 2004. During the establishment of NACEE and the determination of its scope of activities, NACA was seen as an example. NACEE intends to strengthen the co-operation with other networks in the world, in particular with NACA.

NACA's DG delivered a message inviting the newly formed network organization to work closely with NACA, reproduced herewith:

Message from NACA to NACEE

When Laszlo sent me the news that NACEE has been formed, I immediately conveyed NACA's congratulations and best wishes. Through this message I repeat the same wishes to your success and development into a strong organization. NACA looks forward to forging concrete cooperation with NACEE.

While NACEE is a network of institutions and NACA is of governments, we both are guided by a single basic principle – technical cooperation among members.

At this point, I will request a bit more of your time to say something about the practical application of and benefits from networking and cooperation. This, from NACA's experience.

The reason for having a network of aquaculture centres in Asia was that sharing of resources among institutions (and countries) is the only practical and cost-effective means available for identifying and solving the diverse problems – arising from: (a) the diversity of species, farming systems, and environments, and (b) the varying levels of development among the different countries that we serve. Cooperation becomes more compelling with *limited resources*.

The complex and many challenges faced in the development of aquaculture – in both our regions – also argue for a collaborative approach to make efficient use of resources and address common problems.

In NACA, the collaboration among members ensures that its programs and projects address the priority issues and needs of governments and of course their aquaculture sectors. The network facilitates common action so that the programs are owned by members and the product of multi-stakeholder consultation. The



Laszlo Varadi (standing). This photo was taken in Krakow, Poland.

programs are then implemented by the members themselves in a cooperative and coordinated way that builds on – and strengthens – institutional capacities.

Globalization and trade have made it imperative to forge global partnerships. Local problems and developments in distant lands now impact on everyone's peace of mind and even choices. The Governing Council of NACA in 2000 made inter-regional cooperation an important part of the organization's program. We have had useful joint projects with institutions and countries in other regions including the South Pacific, the Americas, Africa and here in Europe. Sometimes we do it in direct partnership, sometimes in a consortium with other international organizations. HAKI is a valued collaborating centre of NACA and has contributed important expertise and technologies to a number of NACA member countries.

Clearly it would be more effective and economical to work with another network that represents a region or several institutions. Which is one reason that we in NACA are delighted that NACEE has been formed and are eager to see you develop into a strong, self-reliant and influential organization.

Training and study tours

Ornamental plants, tilapia and giant prawn hatcheries, Thailand

Three fisheries officers from the National Aquaculture Development Authority (NAQDA), Sri Lanka, came to Thailand for hands-on technical training on three separate subjects. Mrs. Watarakapeli Adikaram Dissanayakalage Champa Priyadharshani Dissanayake was trained on tissue culture of aquatic ornamental plants at the Aquatic Plant and Ornamental Fish Research Institute during 25 July – 24 August. Mr. Chandana Sepala Indunil Pathirana was trained in tilapia hatchery operation and nursery at the Inland Aquaculture Research Institute for the same period. Mrs. Jayasinghe Mudalige Asoka attended training in a freshwater giant prawn hatchery operation for a longer period, 25 July – 9 September. The training was funded by the ADB-Assisted Aquatic Resource Development and Quality Improvement Project in Sri Lanka. Mr. Sujin Nukwan, Director of the Aquatic Plant and Ornamental Fish Research Institute, awarded certificates to the three officers on behalf of training organizers.



Mr. Sujin Nukwan, Director, Aquatic Plant and Ornamental Fish Research Institute, awarding a certificate to Mrs Jayasinghe Mudalige Asoka

Chinese and Indian major carp breeding, India

Mr. Ruwan Heli Pothuwila and Mr. Nawaratne Mudiyansele Raja Sri Rajasinghe, two aquaculturists from the National Aquaculture Development Authority (NAQDA), Sri Lanka, attended a hands-on training

in Indian major carp and Chinese carp breeding and nursery at the Central Institute of Freshwater Aquaculture (CIFA), in Bubhaneswar, India from 2 August to 2 September. As the Regional Lead Centre of NACA officially designated by the Indian Council for Agricultural Research (ICAR), CIFA new director, Dr. N. Sarangi and the training and extension coordinator, Dr. Kuldeep Kumar, made special efforts to tailor the programme to accommodate the special training needs. The training was also funded by the ADB assisted Aquatic Resource Development and Quality Improvement Project in Sri Lanka.

Fisheries extension systems, China

NACA organized a study tour to China on fisheries extension systems and programme development for 16 fisheries officers from the Ministry of Fisheries and Livestock, Bangladesh, 14-24 August. The team, consisting of mostly extension officers, visited various fisheries extension institutions and farmer training and demonstration facilities in Shanghai and Jiangsu. Discussions were held with their counterpart officers in China at national, provincial and country levels regarding the fisheries extension programme development and implementation. The team also visited other extension service providers, such as universities and research institutes.

The study tour was funded by the Fourth Fisheries Project in Bangladesh and attended by Mrs. Rahima Nahar, Mr. Md. Mashiur Rahman, Mr. Mridul Das Gupta, Mr. K. U. M. Shahidur Rahman, Mr. Md. Mahmudul Hoque, Mr. Md. Tazul Islam, Mr. Mojibur Rahman, Mr. Md. Ismail, Mr. Sultan Ahmed, Mr. Saleh Ahmed, Mr. S. M. Rezaul Karim, Mr. Md. Monwar Hossain, Mr. Nitya Ranjan Biswas, Mr. Jouarder Anwarul Islam, Ms. Nazmun Nahar and Mr. Md. Abdun Naser Khan.

Fisheries extension systems, Thailand

With the assistance from the Thai Department of Fisheries, a study tour to Thailand on fisheries extension systems and programme development was organized for 14 Bangladeshi fisheries extension officers, 21-31 August 2004. The study tour team visited government fisheries extension institutions and farmer training and demonstration stations at provincial, district and sub-district levels in central Thailand. The team also visited aquaculture farmer groups / clubs with self-regulation following “good aquaculture practices” (GAP) principles. They had discussions with their Thai counterparts on extension methodology and extension material development.

The Fourth Fisheries Project in Bangladesh funded the study tour. Participants were Mr. A S M Motaharul Hoque, Mr. Subodh Chandra Dhali, Mr. Md. Shajedul Qayyum Dulal, Mr. Md. Shafiqur Rahman, Mr. Md. Fazlul Hoque, Mr. Md. Moazzem Hossain, Mr. Md. Obaidullah, Mr. Khired Kumar Paul, Mr. Md. Hasan Ferdous, Mr. Md. Golam Kibria, Mr. Md. Abdus Sattar, Mr. Md. Mizanur Rahman, Mr. Md. Abdus Sattar Pramanik, and Mr. Mohammad Abdul Hannan Mia.



Bangladesh extension tour with Thai farmer group

Fisheries extension systems, Australia

A senior fisheries delegation from Bangladesh visited Australia to look at the fisheries extension system development, 22-29 August 2004. Queensland was selected as the main

model for analysis of how the fisheries extension system has developed and how it operates to meet the need of the industry, with the assistance of the Department of Primary Industry, Queensland. The delegation also visited Freshwater Fisheries Research Station at Snob's Creek and the New South Wales Fisheries Research Centre at Port Stephens, both of which provided assistance with the Victorian and NSW legs of the tour respectively. Participants were from the Ministry of Fisheries, Bangladesh: Mr. Md. Iqbal Uddin Ahmed Chowdhury, Secretary; Mr. Md. Nasir Uddin Ahmed, Director General; Mr. Khandoker Atiar Rohman, Deputy Secretary; Mr. Mohammad Shahidul Islam, Deputy Director (Aquaculture); Mr. Md. Mohiuddin, Deputy Director (Fisheries); and Mr. Md. Mahbulul Hoque, Deputy Director (Planning).

Freshwater aquaculture, Thailand, China and Lao PDR

A team of 12 fisheries personnel from Cote d'Ivoire, West Africa, undertook a freshwater aquaculture study tour to Thailand, China and Lao PDR, 13 September – 2 October 2004. The study tour team had exposure to a wide range of selected freshwater aquaculture practices, species and techniques in the three countries with relevance to the African conditions. In Thailand and Laos, the programme focused on seed production, nursery, grow-out culture and feeds using locally available ingredients for catfish and tilapia culture, in ponds and cages. Development of indigenous fish for aquaculture was also explored. In China, the study tour paid more attention to traditionally practiced integrated fish farming.

The study tour was funded by the Belgium Technical Cooperation (BTC) under an aquaculture development project in Eastern Cote d'Ivoire. The team included four officers from Ivorian Department of Fisheries, Mr. Koutouan Agba Mathieu, Mr. Elia Aka, Mr. Dapou Kakou Venance and Ms Zikobou Cecile; six farmer managers / technicians, Mr. Kouakou Tano Dominique, Mr. Mian Koffi, Mr. Guetat Kouassi Eugene, Mr. Anoh Koffi, Mr.

Niamien N'draman Germain and Mr. N'guessan Beyla Jean; and two Belgian aquaculture trainers, Mr. Jean Pierre Marquet and Mr. Joris Colman.

Grouper hatchery techniques and marine ornamentals, Thailand

The Secretariat facilitated a study visit in Thailand for a team of 13 fisheries officials from Guangdong Province, China, 21-23 September, following their bilaterally arranged visits to the Philippines and Malaysia. The Guangdong delegation studied the development of hatchery techniques of grouper species and marine ornamental fish breeding in Krabi. The Quality Control and Fish Inspection Division of Thai Department of Fisheries briefed the visitors on policy and institutional arrangement for fisheries product quality and safety assurance and certification. The team also visited a large-scale surimi processing factory in Samut Sakhon Province near Bangkok. The study visit was intended to learn Thailand's experiences to meet the increasing needs for product quality by consumers, because Guangdong is the largest fish producer in China by value and the second largest by volume.

The study tour team was led by Mr. Li Zhujiang, DG, Guangdong Provincial Department of Ocean and Fisheries. Other members in the team included Mr. Chen Liangyao, Mr. Ye Wei, Mr.



Participants from Cote d'Ivoire on study tour in Thailand



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Liang Zhangfu, Ms. Liang Yong, Mr. Cen Guojian, Mr. Wu Zeng, Mr. Lin Zhuoyun, Mr. Yang Wei, Mr. Xuan Xiong, Mr. Lai Yixin, Mr. Wu Dalai and Mr. Li Qing.