



First ever Ministerial Meeting on Aquaculture

The first Asia Regional Ministerial Meeting on Aquaculture for Food Security, Nutrition and Economic Development was convened in Colombo on 28-29 July, hosted by the Government of Sri Lanka. This was the first time an international ministerial-level meeting has been held on aquaculture in the Asian region, or indeed the world. The purpose of the meeting was to discuss regional cooperation in improving the contribution of aquaculture regarding the above issues.

We are very pleased that delegations from seventeen countries were in attendance, namely Bangladesh Cambodia, China, Fiji, India, Indonesia, DPR Korea, Lao PDR, Malaysia, Maldives, Myanmar, Nepal, Philippines, Sri Lanka, Thailand, Timor Leste and Vietnam.

The keynote address was made His Excellency, the Hon. Mahinda Rajapaksa, President of Sri Lanka. The text of the speech is appended below. Opening remarks were delivered by Dr Arni M. Mathiesen, Assistant Director General, Fisheries and Aquaculture Department, FAO; Prof. Sena De Silva, Director General of NACA; and Dr Rajitha Senaratne, Hon. Minister of Fisheries and Aquatic Resources Development,

Sri Lanka. The opening ceremony was followed by ministerial statements concerning aquaculture, food security, nutrition and economic development.

The highlight of the meeting was the issue of the joint "Colombo Declaration", a political commitment to regional cooperation in aquaculture development for food security, nutrition and economic development. The declaration provides a policy framework for Asian governments to collaborate in pursuing these common goals, to share experience and build on each others strengths for the benefit of all.

Recordings of the ministerial statements and other presentations made at the meeting will be available for download from the podcasting section of the NACA website in due course.

The Colombo Declaration is available for download from:

<http://www.enaca.org/modules/wfddownloads/singlefile.php?cid=209&lid=1041>



Keynote address delivered by His Excellency, Mahinda Rajapaksa, President of Sri Lanka

I welcome you all to Sri Lanka, as we are privileged to host this ministerial meeting at a time when we examine the opportunities and challenges to food security in our region and the world, and realise the potential benefits from effective aquaculture development in our region.

As an island nation we have a very long tradition in fisheries, a tradition that keeps expanding with growing demand for fish which forms a very important source amounting to seventy per cent of animal protein in the national diet of Sri Lankans.

It is remarkable that the Asian region with its vast fisheries resources produces more than 90% of the world's farmed fish. This reflects the importance of aquaculture for food security, nutrition, and economic development. But, as in many other sectors of food production essential to humankind, fisheries is also greatly threatened today.

The fisheries resources are over-exploited and the physical resources to produce more fish are fast reaching their limits to yield more under available technology. You meet today facing the challenge of the world having to produce thirty million more tons of fish per year by 2030 to feed an ever growing population.

We often read today of how fish is our last wild food and that our oceans are being picked clean. We learn of factory trawlers that scrape the ocean floor threatening the livelihoods of fishing communities in countries and regions. These trawlers are commercial operations while the small time fisherman goes out fishing as a means of day to day living. This meeting is most timely because the natural habitat of fish is being gravely threatened and aquaculture development is of special importance.

For us to protect our fish farmers, it requires many policy initiatives such as strong trading standards removing non-tariff barriers and eliminating unfair trading practices. Methods that can improve sustainability are necessary because their absence can have adverse effects on small farmers and fishers. These need to be tackled with speed and great sensitivity before vulnerable communities that depend on fishing and fish farming are harmed.

In this context, I am pleased to learn of the approval of the Global Aquaculture Certification Guidelines by the FAO Committee on Fisheries. I commend FAO and urge that all of us make a commitment to implement these guidelines in Asia. I must thank the COFI leadership for setting the global agenda for fisheries and aquaculture.

As aquaculture expands further out to sea issues of responsible management of international waters would pose a challenge to policy makers and planners investors and many other stakeholders. New policies and laws will be necessary on issues such as leasing or renting of the sea with due protection for economic zones.



His Excellency, Mahinda Rajapaksa, President of Sri Lanka.

We have to now face the reality that the world's and our region's marine stocks are fast depleting with small and traditional fishers facing serious livelihood problems. They make up a very large section of the Asian work force. Finding ways to help them is a matter of urgency. Perhaps, one way would be to create opportunities for aquaculture and related service industries as alternative and additional livelihoods. We must also protect and improve our natural stocks of fish so that fishing will continue to provide food, jobs and income.

Aquaculture can also help to address important issues on the environment and social welfare. These include climate change and problems of greenhouse gas emissions. We must also look at aquaculture for improving the coastal environment which is of special relevance to Sri Lanka with the planned growth of tourism.

The growth of aquaculture needs the development of technology in all of its sectors. It is encouraging that we in Asia are rich in related technology and have shown our ability to develop them further and use them for good results. But in a region that is so large it is necessary to overcome the problem of uneven development and fully exploit the great potential for aquaculture and to fully realise the value of this asset.

Although fisheries is part of our lives and has been so through history, yet fisheries and aquaculture are small compared to other Asian countries and I think it will remain so. But it is a major sector for economic growth. Though currently contributing 2% of GDP, this can and should be improved.

In addition to the sea around us, Sri Lanka has many rivers and lagoons and man-made lakes built for irrigation that support fish production. These irrigation tanks have opened the possibility of a rice-fish culture. This can be a dramatic way of producing more food and helping to improve the rice farmer's income.

I am happy to learn that the National Aquaculture Development Authority (NAQDA) established by our government in 1998, in addition to supporting our goals in aquaculture, is also working on the development of rice-fish culture as a means of giving new strength to the rural economy.

I am also reminded of the severe drought that prevails in some countries in the African Continent and I strongly suggest that the FAO along with the WFP and other UN agencies devise a speedy mechanism to provide food for the people in those countries.

Sri Lanka is now catching up with what we lost during three decades when terrorism deprived us of so much of development. It prevented fishing and fish farming in the North and East from getting the same attention as in other provinces. For many years, fishing in the northern and eastern waters had to be prohibited or greatly restricted. Today, with peace prevailing, we are moving to massive national development in every sector including fisheries. We have given a special place for aquaculture and fisheries for a major role in food production, job creation and income generation. These programmes are spread throughout the country today with an added emphasis in the North and East to give the people there, a better life freed of the fear and threats of terror.

I wish to thank FAO for continued assistance to our efforts. On fisheries and aquaculture, I believe that our collective wisdom, knowledge and work will help maintain Asia's leadership in global aquaculture production in the coming decades. It is very important that these same assets should be used to ensure that the countries and provinces less developed in aquaculture are able to fully realise the potential of their fisheries and aquaculture. Cooperation and collaboration is of the utmost importance in this task.

It is important today to look at where we stand in regional cooperation on aquaculture. When the Network of Aquaculture Centres in Asia-Pacific (NACA) was established in 1990 dedicated to aquaculture development, Sri Lanka was one of the first countries to ratify the agreement.

It was a gesture of our commitment to practical regional cooperation in an important area of development. Since then, NACA has become a strong organisation that serves our region and beyond too in aquaculture development. I am happy that NACA is now headed by a fellow Sri Lankan Professor Sena de Silva.

I recall the first Conference on Aquaculture in the Third Millennium, organised by NACA, the FAO and the Royal Thai Government in the Year 2000 when I had the privilege of participating as an honoured guest. The Bangkok Declaration and Strategy, adopted at this conference remains the core instrument for aquaculture development. It has shown strength as an instrument and a guide. Later, it was fortified by the consensus at the Global Conference of Aquaculture held in Phuket in September last year. These are milestones of success but what more can be done?

I wish to remind you that for many years, we have tried to improve the welfare of people in fisheries and improve the productivity from the waters to obtain a richer harvest from the sea and other sources. We have tried many methods from policies to regulations, incentives, subsidies, in fact, everything that public administration allows. We borrowed expertise and technology. We sent our people abroad for training to improve our human resources. We improved facilities for research and technology development.

The results of all this have been mixed. We made some good inroads but, our efforts were also challenged by social, cultural and environmental issues. Yet, some of our projects sustained. These were streamlined into institutional processes.

If there is a lesson I can draw from our few successes, it is that political commitment is the key to sustaining the goal of any initiative. Place this in the larger context of our region and political commitment becomes an even more crucial element. This raises the important question as to how, we in the Asian Region can direct and sustain political leadership and commitment to fisheries and aquaculture development.

We see from experience today that individual states can work together more effectively to achieve common goals, especially, if they provide the means and resources for regional associations to become stronger. Therefore, political leadership and commitment must also be backed with enough resources.

An expanded regional initiative can only be sustained by having both political leadership and adequate resources. That we are not lacking in political commitment will be seen when we adopt the "Colombo Declaration" tomorrow. It is a political commitment to "Regional Cooperation in Aquaculture Development for Food Security, Nutrition and Economic Development in Asia".

But there is another challenge. We have to provide the resources as well. For this purpose, I think the way forward would be to establish a Common Regional Fund that will in the future become a Common Global Fund for responsible aquaculture. If you think this is an idea worth looking at, I believe that in this gathering there is plenty of experience to develop the mechanism for such a fund. Let us not miss such a golden opportunity.

FAO has shown that together we can contribute to the welfare of the people of Asia from where aquaculture stands today and where it should go to. These are great goals. But my concern is that we do not have the luxury of time to reach these stated goals. I am not unduly worried about resources. Together we have the people and material needed to achieve these goals. But the challenge is how we put these resources together that are within different borders and institutions of individual states and territories to work towards our common objectives.

These hopes and challenges make it urgent to commit the Asian political leadership in fisheries and aquaculture to collectively face the problems that will diminish the welfare of our people. This is the challenge we all face today.

There are many issues of international politics and governance that affect aquaculture and fisheries. Product marketing in compliance with various international trading standards is a serious problem to developing countries and to the small scale fish farmers who produce the most of Asia's aquaculture output. Just as in any other agricultural commodity, we must address this situation politically.

Let us remind ourselves that the best results come when farmers, especially, the small holders are empowered technologically and politically. It is when they have both

the means and the voice. With greater awareness and empowerment, higher standards and good farming practice, they will not be driven out of business.

Finally, let me express my fullest confidence in the success of the Ministerial Meeting and my great optimism that its results will strengthen and further promote fisheries and

aquaculture in Asia and also provide effective ways to resolve the problems of overfishing and threats faced by the world's maritime species that are unprecedented in human history.

I wish you well in your deliberations and trust you will have a pleasant stay in our country and carry away the most pleasant memories of Sri Lanka.

Farewell Sena and welcome Eknath!

Message from the new Director General

I am honored and privileged to inform you all that I joined NACA as its new Director General on September 1. I took the baton from Prof. Sena De Silva after a brief and pleasant transition period of 10 days in August interacting with all NACA professional and administration staff on various administration and programme related matters. Let me at the outset; take this opportunity to express my sincere gratitude to the Honourable Members of the Governing Council of NACA for their confidence in me to lead NACA for the next five years. I also wish to express my sincere appreciation to Prof. Sena De Silva for his leadership of NACA during the past five years, his transparent and forthrightness in management decisions, for effecting a smooth transition of leadership to the incoming DG, and most significantly, for implementing important reforms in governance and accountability of the NACA Secretariat. I do pledge to build on the experience and exemplary track record of my predecessors and strive to live-up to the expectations of the GC members, national aquaculture centres of the member governments, donor community, and our partners and well wishers. At the same time, I commit myself to the ideals of NACA as the most cost-effective organisation in the region, true networking of centres, participatory governance, inspiring work environment, and a vibrant multicultural setting.

As I begin my tenure, I wish to draw my inspiration and guiding principles from the two most significant instruments concluded recently and handed over to me by the NACA GC: The Colombo Declaration agreed on July 29th in Sri Lanka by the Honourable Ministers of NACA member governments expressing their commitment to regional cooperation in aquaculture development for food security, nutrition, and economic development in Asia; and A Strategy and Framework for Regional Cooperation in Aquaculture developed by consensus on July 29th in Sri Lanka by the NACA member governments. My immediate task ahead is to translate the strategy framework for regional cooperation and the thematic programmes identified therein into a deliverable action plan for implementation in partnership with the NACA national lead centres, FAO, and various other regional and international organisations. It is my cherished desire that all our partners will join hands with NACA in developing the vision and a road map for regional cooperation for aquaculture.

Now, more than ever, aquaculture is considered as the only viable solution to close the looming gap in demand and supply of food fish. Enhancement of productivity and



Outgoing Director General, Prof. Sena De Silva.



Incoming Director General, Dr Ambekar Eknath.

On behalf of the staff of the NACA Secretariat, I would like to express my sincere thanks to our outgoing Director General, Prof. Sena De Silva, for his contribution to the organisation, aquaculture development and most of all for his dedication to improving the lot of small-scale farmers in the region.

I think it is fair to say that there are few institutional leaders today who have upheld the interests of the region's farmers in such a frank and fearless way. He will be greatly missed by the staff of the Secretariat and we wish him all the best in his renewed endeavours at Deakin University, and we look forward to our ongoing collaboration with him.

I would also like to take this opportunity to welcome our new Director General, Dr Ambekar Eknath, and hope that his years with the organisation will be productive and enjoyable.

Simon Wilkinson, Editor.

sustainability and to establish strong research base for the evolving tropical aquaculture systems will require building of strategic partnerships and alliances. The contemporary research and development agenda is clearly in favour of sustainable farming systems, transparency in production systems, and strict adherence to responsible codes of practice. NACA has contributed significantly to these demanding agenda. Successive leaders and the core professional staff have endeavoured to implement the programmes identified by the NACA Technical Advisory Committee (TAC) and the NACA GC with intense personal interest and dedication. Nevertheless, not all mechanisms are in place in NACA – as can be expected from a young and evolving organisation. Therefore in the near future, as a matter of highest priority, I wish to focus on three essential pre-requisites as NACA embarks on long-term programmes – recruitment of core people in the Secretariat, strengthening of core programmes, and securing of core funds.

NACA undoubtedly is the most cost-effective and one of the most productive organisations in the region. Programme implementation, however, at times, has been hampered due to lack of core-strength in some programmes. There is a need to attract and recruit young professionals from across the region and develop them into core staff committed to the NACA vision and mandate. Attracting senior professionals either on sabbatical and or deputation to NACA for developing new ideas and programmes, and for mentoring of young scientists is also needed at this point in time. I also look forward to committed participation of scientists from the member-government institutions and network centres, throughout the duration of the project/programme in the interest of continuity and sustainability of outcomes.

The uniqueness of NACA is its formal partnering of member-governments in programme development and extremely cost-effective implementation. It is because of this participatory nature that the NACA programmes have always remained

focused, relevant and almost always resulted in substantial benefits to the region. There is, however, a need to develop a proactive anticipatory research agenda for the period of at least fifteen years articulating a portfolio of programmes and strategies for implementation. In this regard, the Strategy and Framework for Regional Cooperation in Aquaculture developed by the member-governments is a step in the right direction. Translating this strategy framework into an action plan will require a much wider consultation involving relevant institutions and individuals.

Securing of funds for implementation of various NACA programmes is usually done by NACA professional staff in response to invitations from certain donor agencies and in consultation with institutions of “target” member countries. Efforts are made to include other “non-target” countries through complementary funds wherever feasible. This project and donor driven approach has often led to skewed benefits and has been a cause of major concern during annual NACA GC deliberations. In his inaugural speech during the high level Ministerial meeting in July in Sri Lanka, his Excellency the President of Sri Lanka, emphasised the need for setting up of a “Regional Fund” for a sustained research and development effort in the regions and for equitable distribution of benefits. Establishment of such a core regional fund can be achieved by political goodwill and commitment.

I look forward to productive and exciting times ahead as we all work together towards our common vision of regional networking and cooperation for the benefit of our peoples in the region.

Ambekar E. Eknath

2nd Regional Training Course on Application of Business Management Principles in Small Scale Aquaculture

NACA in conjunction with the Fisheries Training Programme of the United Nations University and Nha Trang University launched a training programme on the Application of Business Management Principles in Small Scale Aquaculture in 2009. The objective was to develop a training course that would assist small-scale farmers to gain and improve skills that will help them to run an aquaculture business efficiently. The training materials for the programme were initially developed and improved through an inception planning and two preparatory workshops, and have been refined based on feedback from the first run of the training course.

Participants

Thirteen participants attended this second regional training course, which was held at Nha Trang University from 12-20 July 2011. Participants were drawn from Bangladesh, Cambodia, Indonesia, Malaysia, Myanmar, Philippines,

Sri Lanka, Timor Leste and Vietnam. Participants included farmers, government officers, researchers and university teachers. All had either had direct experience in small scale aquaculture or worked closely with small scale farmers and are involved in capacity building for small scale farmers. Participants expertise reflected a broad range of current aquaculture practices and systems prevailing in the region, enabling participants to examine aquaculture development issues from different perspectives and providing an environment where they could interact with diverse views and opinions.

Trainers were experienced professionals from Hólar University, NACA and Nha Trang University, familiar with development context and issues of small scale aquaculture in the region. The training team collectively possessed strong academic backgrounds and expertise in economics, business management, rural development and aquaculture technology.

Course contents and delivery

The course contents have been evolving and continuously improved through various workshops and experience gained from the first run. The second training course consisted of eight modules, most of which were stand alone in terms of content but with continuity and closely related to aquaculture practice, in particular small-scale practices that constitute the backbone of the sector in Asia and current global development trends.

A pre-training need assessment was carried out to determine knowledge gaps and some modifications were made based on the results of the assessment prior to delivery. The course examined important physical, biological and socio-economic factors that impact on farm economic performance. In view of current aquaculture development trends, the concept and importance of better management practices, food safety, global trade, scale of production and farmers' organisation were emphasised. Economic principles were presented and discussed in the context of Asian small scale aquaculture practices. Various essential farm planning and analytical tools were introduced. Classroom exercises and case studies were incorporated into these sessions for participants to practice their skills. Participants were requested before the course to collect farm operation data of either their own farms or systems they were most familiar with. These farm data represented a range of farming systems and formed the base information and cases for participants to apply analytical skills in a real world situation. They were encouraged to draw meaningful conclusions through the analyses, suggest improvement and plan for future operation.

The training was implemented in a learner-centred, four-phase experiential learning approach, which requires participants' active participation in various training activities including:

- Experiencing through lectures, reading, recalling and sharing participants' specific experiences, case studies and field trips.
- Processing through group discussion, sharing experiences, analysing cases / data, and reporting.



- Generalising through summarisation, group discussions on some conclusive statements, and reflecting what participants have learned to their working experiences.
- Applying through individual planning on how the knowledge and skill gained here will be used in participants' work situation and serve the need of small scale farmers in their areas.

Results and evaluation

An evaluation was conducted at the end of the training course. Participants considered the training course to be very relevant to current aquaculture development in Asia. They ranked all the sessions to be very relevant, useful, and important. Their opinions showed that such a training course was important in capacity building of small scale farmers in applying business management skills in their aquaculture practice. This would help them to adapt to dynamic global economic environment and remain competitive.

All participants successfully completed the training programme with upgraded knowledge and skills in economics, farm planning and management. All of them demonstrated their confidence in improving farming efficiency through applying economic principles and analytical and management tools in their case studies. They expressed their determinations to extend what they have learned in the training course to other farmers.

In delivering the sessions, trainers tried to simplify the complex economic concepts and presented them in a direct and applicable way. Participant experiences were incorporated in almost every session so that they could understand the concepts and apply skills through examining their own farming practices. This methods proved to be very effective in stimulate their learning interests and self motivation, and hence ensured a high level of efficiency of knowledge and skills transfer.

Look to the future

Improving business management skills for small scale aquaculture farmers in Asia requires a long term effort and is a great need. Along with technological advances, application of business management principles in small scale aquaculture is becoming critically important to retain its competitiveness and sustainability. Considerable attention and inputs are expected from academic institutions, governmental organisations, NGOs and other development agencies to ensure that capacity building of small scale farmers in this aspect is not neglected and the endeavour sustained and successful.

The training team is currently still working on the training materials and course contents, looking for further improvement based on participants' evaluation and trainers' feedbacks. The possibility of localising the training materials and carrying out in-country training of farmers using local resource persons and languages will be explored.

NACA will make all endeavours to conduct this course as a regular annual event, with continuous modifications to the course material to 'pitch' the course to the rural small scale farmer, in a manner that is comprehensible, applicable and adaptable to their circumstances.

Consultation on Lake and Reservoir Fisheries and Aquaculture Development in Asia

The ICEIDA funded project on *Strategies for development of Asian reservoir & lake fisheries management* concluded with a final Consultation on Lake and Reservoir Fisheries and Aquaculture Development in Asia. The consultation was held at the Institute of Hydrobiology, Chinese Academy of Science, Wuhan from 20-24 September.

The consultation organised by NACA in conjunction with the Institute of Hydrobiology was co-hosted by the Institute of Hydroecology, Ministry of Water Resources, Chinese Academy of Sciences, State Key Laboratory for Hydroecology and Biotechnology, Institute of Hydrobiology, and WWF-HSBC Climate Change Partnership, and brought together over 40 key researchers from nine Asian countries and the FAO.

The consultation brought together over 40 key researchers from nine Asian countries and the FAO. There was a significant representation from the Mekong River Commission (MRC) Fisheries Programme, from all riparian countries, including the program coordinator, Xaypladeth Choulamany. The consultation was declared opened by the Director of the Institute of Hydrobiology and short introductory remarks were given by Miao Weimin, Aquaculture Officer, RAP/FAO, Bangkok, Sena S De Silva, Former Director General of NACA and Wang Zhaomin, Director General, Hubei Fisheries Bureau, China.

The scientific proceedings were divided into five sessions, with Session 1 consisting of key note addresses by Li Zhongjie on "Development and reform of lake and reservoir fisheries in China", Sena S De Silva, on the "Importance of



reservoirs and lakes in food fish production in Asia”, and Chang Jianbo “On successful stimulation of gonad maturation of freshwater reared *Acipenser sinensis* by controlling annual temperature patterns”. The other sessions were conducted on the following themes: Country perspectives, management aspects, ecosystems / stock enhancement / water quality, and translocations / introductions / climate change. Each session was followed by a discussion on the common issues relevant to improving fish production in lakes and reservoirs in the region and related environmental aspects. The consultation also discussed in detail a concept proposal for a “Regional Program on Stock Enhancement” developed by the MRC in consultation with NACA and the FAO, at a consultation held in Vientiane, Lao PDR in August 2010. The group made further suggestions to expand the scope of the activity and endorsed

that this concept proposal be developed as a regional project to be funded under the Technical Cooperation Programme (TCP) of the FAO. The concluding remarks of the consultation were delivered by Mr Arni Helgason, Icelandic International Development Agency and Professor Liu Jiashou of the Institute of Hydrobiology, Chinese Academy of Sciences.

The participants had the opportunity to visit Liangzhi Lake where major management changes have been made, resulting in significant improvements in economic gains and improvements in water quality. The lake fishery now essentially concentrates on the production of Chinese mitten crab and mandarin fish, both high valued species. Over the years the improved management has been successful in eliminating eutrophication problems in the lake.

Asia Regional Seminar on Certification for Small Scale Aquaculture in Thailand

Over the last few years there has been a surge of interest in the development of certification standards for aquaculture products. Many certification schemes have been established addressing a diverse range of issues surrounding aquaculture production including environmental integrity, food safety and quality, social responsibility, animal health and welfare and other issues such as organic aquaculture.

The implementation of certification standards in Asian aquaculture is confounded by the fact that the majority of farms are small scale holdings. There are a very large number of them, they are organised very loosely or not at all and farmers are for the most part poor. This is the context in which aquaculture certification must be implemented. Individual certification is very difficult to implement in the region due to the practicalities of dealing with large number of small scale farmers and their limited capacity to bear associated costs. Increasingly, Governments are encouraging group-based management approaches to empower small scale producers to overcome these issues.

FAO and the Thai Department of Fisheries have conducted a joint project on Certification for Small Scale Aquaculture in Thailand. The project aimed to help small scale farmers implement certification through a group approach, to enhance their market access and improve their environmental, social and economic sustainability. Working in a group reduces the cost of certification for individual farmers, improves market access and assists farmers to move up in the value chain. The project initially conducted public consultations amongst all players in the supply chain to gather views on existing certification systems, their practicality, credibility, implementation status and constraints. Consultations were also held with selected groups of small scale farmers to ensure that their opportunities and constraints were given priority consideration. The feedback was used to develop recommendations on improving certification systems for aquaculture in Thailand. The project also convened training in group certification for small scale farmers, for farmers, government officers and NGOs involved in this activity.

The development of a group-based aquaculture certification scheme was piloted with shrimp farmers in Chantaburi and Trang provinces and tilapia in Chonburi and Petchaburi provinces. The project assisted farmers to register their group with the government, to establish governance and record keeping systems, and to establish an internal control system in order to facilitate compliance with required production standards and traceability. A Standard Farming Manual was prepared by each group describing the farming practices required of group members. Groups held crop planning meetings before commencement of the crop cycle, and held monthly meetings during grow out to discuss production issues and provide mutual technical support. Groups typically entered into group contracts for purchase of inputs such as seed and feed in order to benefit from bulk order discounts. Overall the groups have been very positive in their responses and comments on the project, and there has been a marked improvement in farming practices as a result of the group approach, standardisation and training.

As the project is nearing completion, a regional seminar was held in Bangkok from 15-16 September to share the experiences of Thailand more widely with countries within ASEAN and with other organisations that are that working on certification and related trade issues for small-scale aquaculture. Around 50 people attended the seminar, including representatives from the governments in the region, representatives of Thai shrimp producers, and private-sector organisations with an interest in certification such as Fairtrade, TÜV NORD and others.

Project personnel gave presentations on the experiences gained in the establishment and certification of farmer groups; development of traceability and GIS systems to support certification and analysis of the Thai national certification system. This was followed by a general discussion on a report commissioned by the project examining the issue of harmonising the Thai system with the FAO Guidelines on Aquaculture Certification; and progress in developing an ASEAN standard for shrimp certification and scaling up strategies. As the current proliferation of certification standards has caused fragmentation and confusion in

the industry, participants also discussed the concept of developing a system for benchmarking aquaculture certification standards against the FAO Guidelines on Aquaculture Certification as a means to establishing equivalence between different certification standards.

The project was funded by FAO through a Technical Cooperation Programme facility. A website is in development based on the outcomes of the project, including online traceability database will be available in due course.

Special issue of the AFS Journal: Integrated technologies for advanced shrimp production

The special issue is a collection of papers presented at the "Symposium on Integrated Technologies for Advanced Shrimp Production" which was held in October 13-15, 2009 in the East-West Centre, University of Hawaii and sponsored by a grant from the National Oceanic and Atmospheric Administration to the Oceanic Institute.

The special issue consists of 12 papers which include contributions from renowned scientists who are no strangers to the shrimp farming world. Together, they present the latest in shrimp farming, dealing with cutting edge technologies on topics ranging from genetics, to environmental and health management. The 222 page hard copy of the special issue costs US\$10 for AFS members and US\$20 for non members. Contact info@asianfisheriessociety.org for orders. The special issue includes the following papers:

1. The Global Status of Significant Infectious Diseases of Farmed Shrimp (Lightner, D.V. and R.M. Redman).
2. Emerging Diseases in Shrimp Culture: Overview of Viral and Bacterial Diseases in the Americas (Marcela Salazar, Lacides Aragon, Linda Gúiza, Xenia Caraballo and Clarissa Granja).
3. Immunomodulation by DNA Vaccination against White Spot Syndrome Virus (WSSV) (Tomoya Kono, Jean Fall, Hiroki Korenaga, Hiroaki Takayama, Toshiyuki Iizasa, Tohru Mekata, Toshiaki Itami and Masahiro Sakai).
4. Promoting Health Management of Shrimp Aquaculture on Guam and Commonwealth of Northern Mariana Islands (Hui Gong).
5. Environmental Management of Shrimp Farms in Asia to Promote Healthy Shrimp and Reduce Negative Impacts (Claude E. Boyd).
6. Performance of a Closed Recirculating System with Foam Separation, Nitrification and Denitrification Units for Intensive Culture of Kuruma Shrimp, *Marsupenaeus japonicus*: a Bench Scale Study (Oshihiro Suzuki, Tsuyoshi Takeshima, Thoru Mekata, Tomoya Kono, Masahiro Sakai, Toshiaki Itami and Toshiroh Maruyama).
7. Integration of Quantitative and Molecular Genetics in Shrimp Breeding (John A.H. Benzie).
8. Identification and Expression Analysis of Nitric Oxide Synthase Gene, Mj NOS, in Kuruma Shrimp *Marsupenaeus japonicas* (Mari Inada, Tohru Mekata, Raja Sudhakaran, Shogo Okugawa, Amel Mohammed el Asely, Nguyen T. H. Linh, Terutoyo Yoshida, Tomoya Kono, Masahiro Sakai, Toshifumi Yui and Toshiaki Itami).
9. Genetic Improvement and Farming Technological Innovation on Fleshy Shrimp *Fenneropenaeus chinensis* in China (Qingyin Wang, Jian Li, Jie Kong, Jie Huang, Weiji Wang, Xianhong Meng and Yuying He).
10. Development of Rapid, Simple and Sensitive Real-Time Reverse Transcriptase Loop-Mediated Isothermal Amplification Method (RT-LAMP) to Detect Viral Diseases (PRDV, YHV, IHNV and TSV) of Penaeid Shrimp (Raja Sudhakaran, Tohru Mekata, Mari Inada, Shogo Okugawa, Tomoya Kono, Kidchakan Supamattaya, Terutoyo Yoshida, Masahiro Sakai and Toshiaki Itami).
11. Omics' Studies for Genetic Improvement of Shrimp in China (Fuhua Li and Jiahai Xiang).
12. An Integrated Approach to Sustainable Shrimp Farming (Shaun M. Moss, Dustin R. Moss, Clete A. Otoshi and Steve M. Arce).

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Farmers as Stakeholders in Commercial Aquaculture: Free download

As part of its Golden Juilee celebrations, the Central Institute of Fisheries Education held a symposium on farmers as stakeholders in commercial aquaculture. The proceedings are available for download (PDF, 17MB) from the CIFE website. The contents includes:

- Farmers as Stakeholders in Commercial Aquaculture – a Synthesis (M. Krishnan, P.S. Ananthan, R.S. Biradar, W.S. Lakra).
- Inclusive Shrimp Farming: Development Model For Marginal Stakeholders In India (Manoj M. Sharma).
- Fishers First: Participatory Model in Seaweed Farming in India (Abhiram Seth and Tanmaye Seth).
- High value aquaculture and marginal stake holders in India with special reference to *L. vannamei* (Saji Chacko).
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Marker for banned antibiotic naturally occurs in freshwater prawns and other crustaceans

A recent paper in the Journal of Agricultural and Food Chemistry reports that a marker for the banned antibiotic nitrofurazone naturally occurs in freshwater shrimp and other crustaceans. The finding is of trade significance, since laboratory tests for chemical residues can lead to the rejection of imported consignments and restrictions on market access. As the sensitivity of laboratory tests increases, there is increasing risk that false positives may be generated by natural background levels of chemicals in the environment. The abstract of the paper follows below:

Van Poucke, C., Detavernier, C., Wille, M., Kwakman, J., Sorgeloos, P., Van Peteghem, C. 2011. Investigation into the possible natural occurrence of semicarbazide in *Macrobrachium rosenbergii* prawns. Journal of Agricultural and Food Chemistry 59(5): 2107-2112.

Abstract

In the past year there has been an increased incidence in Belgium of cases of positive semicarbazide (SEM) tests in imported freshwater *Macrobrachium rosenbergii* prawns, seemingly indicating the possible abuse of nitrofurazone, a banned antimicrobial agent.

This was in contrast to all other European countries where no significant increase in SEM-positive samples was detected. A possible explanation for this discrepancy between Belgium and the other European Union member states could be the fact that only in Belgium were whole prawns (meat and shell) analysed for the presence of tissue-bound metabolites of nitrofurans, whereas in the other countries only the edible part (meat) of these prawns was analysed.

To investigate the possible natural occurrence of SEM in freshwater prawns, an animal trial was set up.



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In this experiment two groups of 10 juvenile *M. rosenbergii*, previously raised under standardised laboratory conditions, were stocked into two separate aquaria, a control group under reference conditions (no addition of nitrofurazone) and a group exposed to a daily dose of 50 mg of nitrofurazone L⁽⁻¹⁾ of culture water.

Results of this animal trial proved that SEM naturally occurs in *M. rosenbergii* prawns but that at the current minimum required performance limit (MRPL) no tissue-bound SEM can be found in the meat of nontreated animals. In addition to this animal trial, commercial samples of other crustacean species, the shell and meat of which were analysed separately, were also analysed for the presence of SEM.