



# Work plan 2009+

## Livelihoods and food security for rural communities

Network of Aquaculture Centres in Asia-Pacific





# Asian Aquaculture in Perspective

## Vital to food security

Wild fisheries are now fully exploited. By 2025 the world will need another 40-60 million tonnes of fish just to maintain the per capita consumption at current levels.

This demand can only be met through responsible aquaculture. Aquaculture already accounts for more than 50 percent of global food fish consumption, and this contribution is growing.

Fish is often the only affordable source of animal protein available to the poor in developing nations. Aquaculture plays an important role in human health and nutrition by providing low-cost animal protein and nutrients to nutritionally challenged people in the developing world.

## Asia accounts for 92% of global aquaculture production

Global aquaculture production in 2006 was estimated at 56.7 million tonnes, valued at US\$ 86.2 billion. More than 92% of this was produced in Asia, by volume.

## Small-scale farms

Asian aquaculture is characterised by small-scale family-operated farms that are typically less than one hectare in area. The sector is a major source of income and employment for rural communities.

The small-scale nature of the sector poses special challenges in confronting emerging issues such as globalisation, the evolving international trade environment and maintaining environmental integrity.

## ► About NACA

### What NACA is

NACA is an intergovernmental organisation that promotes rural development through sustainable aquaculture and aquatic resources management. NACA seeks to improve the livelihoods of rural people, reduce poverty and increase food security. The ultimate beneficiaries of NACA are farmers and rural communities.

### How it works

NACA implements development assistance projects in partnership with research centres, governments, development agencies, farmer associations and other organisations. NACA supports technical exchange and capacity building, institutional strengthening and the development of policies for sustainable aquaculture and aquatic resource management.

### Organisational structure

The network is coordinated and administered by a Secretariat based in Bangkok. NACA policy is determined by its Governing Council, consisting of representatives of member governments, which meets annually to articulate needs and priorities. The NACA work plan is developed by a Technical Advisory



Employment for rural communities: Collecting giant freshwater prawn broodstock, Bangladesh.

Committee, formed from technical experts nominated by member governments. The work plan is implemented by a network of participating research centres in collaboration with governments, donor agencies, farmer associations and NGOs.

### Membership

Government membership of NACA is via accession to the NACA Agreement, an international treaty. The agreement also provides for associate membership by intergovernmental organisations and donor agencies.

“NACA seeks to reduce poverty and improve the livelihoods and food security of rural communities”.

## ► Members and centres

### Member governments

Current member governments of NACA are:

- Australia
- Bangladesh
- Cambodia
- China
- Hong Kong SAR, China
- India
- Indonesia
- I.R. Iran
- Korea (DPR)
- Malaysia
- Myanmar
- Nepal
- Pakistan
- Philippines
- Sri Lanka
- Thailand
- Vietnam

### Non-voting member

- Food and Agriculture Organization of the United Nations

### Associate member

- Secretariat of the Pacific Community

“Twenty years of operation has proven NACA to be a successful model for facilitating sustainable aquaculture development.”



The introduction of better management practices has improved shrimp harvests and reduced environmental impact, Aceh, Indonesia.

### Participating centres

The core of NACA is a collaborative network of aquaculture research centres distributed throughout the region. Participating centres share their expertise and facilities for mutual benefit, to avoid duplication of effort and to maximise return on limited R&D resources.

The network is also underpinned by five Regional Lead Centres, which serve as support hubs for others in the network.

Research centres that wish to formalise their participation in the network may do so via MOU with the Secretariat. Please write to [info@enaca.org](mailto:info@enaca.org) for more information about the process.

## ► **Regional Lead Centres**

### **Freshwater Fisheries Research Center, Wuxi, China**

The Freshwater Fisheries Research Center (FFRC), strives to increase the availability of accessible technology in the field of fisheries/aquaculture from China. FFRC focuses on improving the capacity of personnel and the usability of technology related to hydrobiology, aquaculture, farm planning and management.

### **Central Institute for Freshwater Aquaculture, Bhubaneshwar, India**

The mandate of the institute is to conduct research on nutrition, physiology, genetics, pathology, pond environmental monitoring and aquaculture engineering for development of intensive and extensive freshwater farming systems. The institute conducts specialised training and extension programmes and acts as a nodal agency for scientific information and technology transfer.

### **SEAFDEC Aquaculture Department, Iloilo, Philippines**

The SEAFDEC Aquaculture Department was established to conduct research, develop technologies, disseminate information and train people in the farming

“The key to NACA’s success is its large network of collaborating research centres distributed throughout the region.”

of fishes, crustaceans, molluscs, and seaweeds for food, livelihood, equity, and sustainable development.

### **Inland Fisheries Research and Development Bureau, Bangkok, Thailand**

The bureau is responsible for research and development planning on freshwater fisheries resources, including resource assessment studies, development and introduction of high-yielding production technologies and human resource development.

### **Coldwater Fisheries Research Center, Mazandaran, Iran**

The Coldwater Fishes Research Center is part of the Iranian Fisheries Research Organization. It is located adjacent to the important coldwater aquaculture production areas of Dohezar and Sehezar, on the banks of the Tonekabon River by the Caspian Sea.

## ► Work plan 2009+

### Work programmes

The research and development mandate of NACA is addressed through six interlinked thematic work programmes that support sustainable aquaculture and aquatic resource management, policy development and inter-governmental cooperation in the region. These are:

- Aquatic Animal Health
- Coastal Aquaculture
- Emerging Global Issues
- Food Safety and Quality
- Genetics and Biodiversity
- Inland Aquaculture



“The NACA work plan is revised to meet changing priorities biannually, on the advice of the Technical Advisory Committee.”

Two additional cross-cutting work programmes facilitate and support implementation of the thematic work programmes:

- Education and Training
- Communications

### Implementation

The programmes are implemented through the development of projects and activities by the Secretariat in collaboration with participating research centres, member governments and other partners.

Individual projects draw heavily on the personnel and facilities of participating centres. Projects are essentially implemented by the centres with the Secretariat acting as a coordinating body.

NACA also works in close cooperation with FAO, international donor agencies and other regional and international organisations in implementing the work plan.

Affordable fish and sustainable livelihoods from environmentally friendly wastewater fed aquaculture, Kolkata, India.

## ► Aquatic Animal Health

The Aquatic Animal Health Programme assists members to reduce the risks of aquatic animal diseases impacting the livelihoods of farmers, national economies, trade, environment and human health. This is achieved through:

- Improving regional cooperation in aquatic animal health and welfare
- Developing and implementing national strategies on aquatic animal health
- Improving surveillance, reporting and response to disease emergencies
- Promoting harmonisation of diagnostic procedures and risk assessment
- Widespread promotion of better aquatic animal health management practices at the farm level

### Key activities

- Coordinating annual Asia Regional Advisory Group meetings and bringing regional issues to the attention of global standard setting bodies such as the Office International des Epizooties



Simple changes in management practices have vastly improved crop outcomes for small-scale farmers.

- Establishment and expansion of a three tier shared regional resource base in aquatic animal health
- Development of farm-level health management tools for key aquaculture commodities
- Supporting regional disease surveillance and reporting
- Strengthening aquatic animal health capacity and biosecurity in the region
- Facilitating harmonisation in disease diagnostic techniques
- Developing resource material in support of disease diagnosis and surveillance

“Implementation of practical national aquatic animal health strategies will minimise the impact of disease and support development of sustainable aquaculture.”

## ► Coastal Aquaculture

The major thrusts of the programme are responsible shrimp farming and marine finfish aquaculture.

NACA facilitated a consortium approach to the development of the *International Principles for Responsible Shrimp Farming*. The focus is currently on assisting small scale farmers to put the principles into practice through the development and implementation of better management practices. This approach has led to major institutional and policy changes in the region.

NACA maintains the Asia-Pacific Marine Finfish Aquaculture Network, established in 2001. This network supports the development of sustainable marine finfish farming in the Asia-Pacific region through R&D cooperation and also works on the development of better management practices for key mariculture commodities.

### Key activities

- Strengthening networking amongst projects developing better management practices for shrimp culture in the region

“NACA has played a key role in developing small-scale marine finfish aquaculture technology and better management practices for shrimp aquaculture.”



Small-scale marine fish farming provides livelihoods for isolated communities, Koh Yao Noi island, Thailand.

- Scaling up the adoption of better management practices for shrimp farming at national and regional levels
- Development and implementation of better management practices for key marine finfish species
- Capacity building of small-scale farmers to access better markets
- Addressing the merits of using trash fish vs compounded feeds in marine finfish aquaculture
- Responsible use of aquatic resources in mariculture
- Coordination of the Asia-Pacific Marine Finfish Aquaculture Network



## ► Emerging global issues

A new initiative, the Emerging Global Issues Programme focuses on issues such as climate change, energy efficiency and alternatives to use of fish meal in aquaculture feeds.

The purpose of the programme is to provide guidance and leadership on key emerging policy issues and actively promote south-south cooperation in aquaculture development. The programme will also endeavour to bring to public domain the positive aspects of aquaculture as a significant contributor to food security and the livelihoods of rural communities.

The first major activity of the programme is a major regional initiative evaluating the vulnerabilities of aquaculture farming systems to climate change and potential adaptive measures.



“NACA assists member governments to reach consensus and collaborate in addressing global issues of common interest.”

### Key activities

- Development of projects and policy guidance on emerging issues of regional interest
- Providing a regional platform for members to develop regional strategies to address emerging global issues
- Evaluating the vulnerabilities of aquaculture farming systems to climate change
- Strengthening adaptive capacities of small-scale resource-poor farmers to the impacts of climate change
- Contribute to the global dialogue on use of fish meal and oil in animal feeds and resource usage in the reduction industry
- Playing a catalytic role in south-south cooperation in aquaculture development
- Communication of success stories in aquaculture

Climate change will affect aquaculture systems world wide. NACA has begun research that will help farmers prepare and adapt.

## ► Food Safety and Quality

Food safety is a key concern for international trade in fish products. The constantly changing regulatory environment and safety requirements of importing countries pose a special challenge to small-scale aquaculture producers.

This new work programme assists members to assure the safety and quality of aquaculture products through the adoption of science-based better management practices. Aquaculture certification and market access activities are also addressed.

The programme focuses on assisting small-scale farmers to adapt to the changing trade and safety environment. Cluster-based management approaches and formation of farmer societies are promoted as practical mechanisms for implementation of better management practices.

“Adoption of better management practices can significantly improve food safety and quality, and provide a basis for product certification.”

### Key activities

- Evaluation of commodity-specific better management practices for meeting domestic and international food safety standards
- Facilitating establishment of national residue testing and monitoring programmes and sharing of information amongst member countries
- Improving access to markets by small-scale farmers
- Improving market development for low-cost aquaculture commodities
- Address biosecurity and associated human health issues regarding the consumption of fish and processed products
- Development of farmer groups and cluster-based certification concepts and methodologies



NACA is working to help address food safety through the entire market chain from hatchery to consumer.

## ► Genetics and Biodiversity

The Genetics and Biodiversity Programme provides support to members in their efforts to conserve and manage aquatic biodiversity, and to minimise the impacts of aquaculture activities on local biodiversity.

The programme develops, disseminates and implements broodstock management strategies that assure farmers of healthy and viable seed for important aquaculture species while minimising the impacts of captive bred animals on the genetic diversity of their wild counterparts.

The programme also endeavours to promote regional and international cooperation on aquatic genetic resources management.

### Key activities

- Genetic characterisation of aquatic genetic resources
- Development of management guidelines for important genetic resources
- Capacity building on broodstock management

“Conservation of genetic resources is a particularly important issue for developing countries that are heavily dependent on their natural resource base.”



Threatened mahseer. NACA developed the region's first comprehensive genetic management plan addressing both wild and captive stocks in Sarawak, Malaysia.

- Capacity building in application of molecular tools in aquaculture and inland fisheries management
- Application of genetic technologies in adaptation to climate change
- Facilitation of the Consortium on Freshwater Fish Genetics and Breeding
- Assessment of better management practices for environmental standards
- Development of conservation plans for threatened species
- Raising awareness of aquatic genetic and biodiversity issues in the region

## ► Inland Aquaculture

Fish is a healthy and traditional food resource of inland rural areas in Asia. This programme supports the development of sustainable inland aquaculture to benefit rural development.

Emphasis is given to culture-based fisheries development as an effective means of improving the food security and livelihoods of rural communities.

The programme also emphasises the development of better management practices for key freshwater aquaculture species in the region.

Better management practices assist farmers to increase their resource utilisation efficiency, improving farm production and environmental performance simultaneously.

### Key activities

- Development of culture-based fisheries in member countries
- Development and implementation of better management practices for catfish farming in the Mekong Delta

“Culture-based fisheries in small water bodies are an effective way to improve the food security and livelihoods of rural communities.”



Harvesting a small pond in Mymensingh, Bangladesh. Fish accounts for 60-80% of the animal protein consumed by the population.

- Improved management of reservoir fisheries in the Asian region
- Management strategies to resolve capture-culture conflicts in reservoirs
- Development and validation of better management practices for key freshwater aquaculture commodities including common carp, tilapia and giant freshwater prawn
- Sharing experience and documenting successful case studies in inland aquaculture development
- Publication of technical manuals and extension material to facilitate development of inland aquaculture

## ► Education and Training

The Education and Training Programme assists capacity building among NACA members through the exchange and sharing of knowledge and skills between members.

Activities may take the form of training courses, study visits and personnel exchange. The programme also supports the training components of the other thematic programmes.

Regular training activities include:

- An intensive course on integrated rice-fish farming, hosted by the Freshwater Fisheries Research Center in Wuxi, China
- A regional grouper hatchery production training course, hosted by Indonesian research centres participating in NACA's Asia-Pacific Marine Finfish Aquaculture Network
- Training in website management and administration, hosted by the NACA Secretariat

Building capacity in the use of molecular genetic tools for inland fisheries and aquaculture management, Kasetsart University, Thailand.

“Capacity building at all levels is an essential requirement for sustainable development.”

### Key activities

- Identifying training needs for aquaculture development in NACA members
- Identifying and organising relevant expertise and capacities to meet the training needs
- Developing training modules and materials
- Facilitating routine education and training activities of NACA
- Facilitating and coordinating exchange programmes among members and with other regions



## ► Communications

The Communications Programme extends the outputs of the NACA work programmes to the aquaculture community at large and provides a platform for sharing information and experience. The major focus of the programme is on electronic publishing and extension. All NACA news and publications are made available for free download via the NACA website. The programme also assists partner organisations to build their own capacity in electronic publishing.

### Key activities

- Communicating the outputs of the NACA thematic work programmes
- Development and maintenance of NACA website
- Production of NACA's serial publications, including Aquaculture Asia Magazine and the NACA Newsletter
- Building the capacity of partner organisations in website management and online publishing

“Visit [www.enaca.org](http://www.enaca.org) for the latest aquaculture news, publications and projects in the region.”

The screenshot shows the NACA website interface. At the top, the NACA logo and the title "Network of Aquaculture Centres in Asia-Pacific" are visible, along with the subtitle "SUSTAINABLE AQUACULTURE AND AQUATIC RESOURCE MANAGEMENT". A navigation menu on the left lists various categories such as "Search", "NACA programmes", "Health Programme", "Inland Aquaculture", "Marine Fishfish Culture", "Shrimp Farming", "Training Programme", "Special Issues", "Diet Management", "Certification & Trade", "Mangroves", and "Feature publication". The main content area features a "Spotlight" section titled "Mariculture development opportunities in SE Sulawesi, Indonesia" with a photograph of a boat on the water. Below this are sections for "Select a news topic", "Advertisements", "Headlines", "New publications (Free downloads)", and "New projects". The right sidebar includes a "NACA news" section, a "Biomim" logo, and a "Download new issue" section for "Aquaculture Asia Magazine". The footer contains the copyright notice "© 2001-2009 Network of Aquaculture Centres in Asia-Pacific" and the theme "Theme by Lina7208-net".

## ► Selected Publications

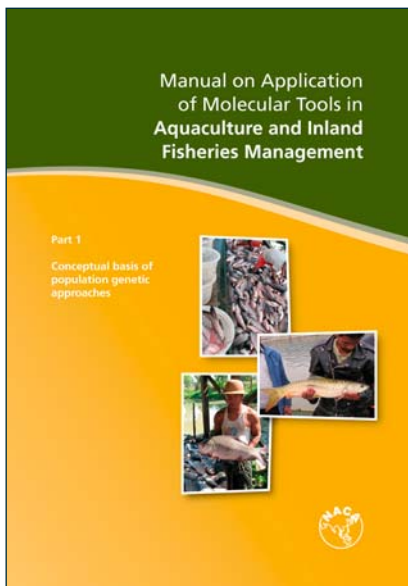
“All our publications are free. More than half a million copies have been downloaded from the NACA website since 2004.”



Aquaculture Asia Magazine. Published quarterly by NACA. ISSN 0859-600X.

Success Stories in Asian Aquaculture, 2009 (edited by: De Silva, S.S., Davy, B.). NACA, Bangkok, Thailand. 160 pp. ISBN: 978-611-90003-0-8.

Aquatic Animal Diseases Significant to Asia-Pacific: Identification Field Guide, 2007. Australian Government Department of Agriculture, Fisheries and Forestry, Canberra. Prepared by A. Herfort and CV Mohan. CD ROM.

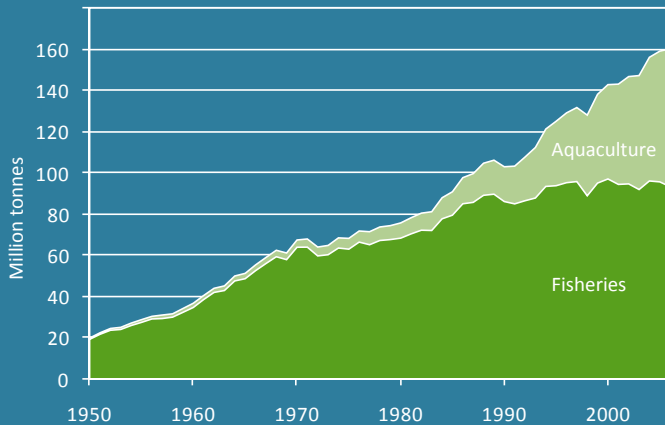


Manual on Application of Molecular Tools in Aquaculture and Inland Fisheries Management, 2007 (Nguyen, T.T.T., Hurwood, D., Mather, P., Na-Nakorn, U., Kamonrat, W., Bartley, D.). Part 1. Conceptual Basis of Population Genetic Approaches. 80 pp. ISBN: 978-974-88246-1-1; Part 2. Laboratory Protocols, Data Management and Analysis. 134 pp. ISBN: 978-974-88246.

Manual on Best Practice Approaches to Culture-based Fisheries Development in Asia, 2006 (edited by: De Silva, S.S., Amarasinghe, U.S., Nguyen, T.T.T.). ACIAR, Canberra, Australia. 93 pp. ISBN: 1 86320 4571.

Shrimp Health Management Extension Manual, 2003. Prepared by the Network of Aquaculture Centres in Asia-Pacific (NACA) and Marine Products Export Development Authority (MPEDA), India, 36 pp.

## Relative contributions of fisheries and aquaculture to global fish production



## Global aquaculture production volume by region 2006 (percent share)



## Network of Aquaculture Centres in Asia-Pacific

NACA is an intergovernmental organisation that promotes rural development through sustainable aquaculture and aquatic resources management. NACA seeks to improve the livelihoods of rural people, reduce poverty and increase food security. The ultimate beneficiaries of NACA are farmers and rural communities.

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