



Marine finfish seed production and growout training course, July 2018, Thailand

The 9th Regional Training Course on Marine Finfish Seed production and Grow-out will be held from 2 - 20 July 2018 in Krabi, Thailand. The course will be taught by staff of the Krabi Coastal Fisheries Research and Development Centre. The training course will be conducted in English.

Marine finfish aquaculture has been significantly contributing to fish production and the economies of coastal communities in Asia. During the past few decades, substantial advances have been made in science and technology on marine finfish aquaculture and the region has accumulated a wealth of knowledge and technical expertise.

Drawing on expertise throughout the region and supported by experienced field experts in collaborating centres, this three-week hands-on training course will provide participants with skills in marine finfish seed production and grow-out operations, with an emphasis on tropical groupers and Asian seabass (*Lates calcarifer*).

Who should apply?

Professionals who are interested in:

- Upgrading knowledge in marine finfish production.
- Enhancing skills in marine finfish hatchery and grow-out operations.
- Looking for innovative ideas.
- Improving efficiency and profitability of business operations.
- Building academic and business connections.

Who are the trainers?

- Academicians and fish biologists from leading universities and research institutes specialised in marine aquaculture.
- Experts in phytoplankton and zooplankton labs and live feed production.
- Experienced hatchery technicians.
- Professionals from commercial companies and hatcheries.

What will I learn?

You will practice broodstock selection and maintenance, induce fish to spawn, incubate eggs, prepare live feed and develop feeding regimes for newly hatched larvae, practice



early and advanced nursing, seed harvesting, packaging and transportation and observe grow-out operations. You will also be presented with a theoretical background on biology, reproductive physiology, nutrition and health management. Field visits will showcase production technology and operation of small and medium-scale grouper hatcheries, nurseries, grow-out farms, live feed production and supply, and live seafood exports in Thailand. Some government research and extension institutes will also be visited. Topics covered in the training course include:

- Biology of major cultured marine finfish (groupers, seabass, snapper, and pompano).
- Site selection, hatchery design, equipment and setup.
- Broodstock selection and management.
- Egg handling and incubation.
- Water quality management.
- Nutrition, feed and feeding for marine finfish larvae.
- Live food production.
- Larviculture and nursery of fry.
- Biosecurity.
- Diseases and fish health management.
- Harvest, packaging and transportation of fish seed.
- Grow-out operations.

- Aquaculture business management and investment appraisal.

Seminars on special interests

- Production techniques of mud crabs.
- Marine ornamental fish: Major species, production and market perspectives.

Training activities

- Lectures, discussion and classroom exercises: (30% of training time).

- Hands-on practices (50% of training time).
- Field trips and others (20% of training time).

How to apply?

Download the application form below, fill in and send it to NACA through post, fax or email or apply online at <https://enaca.org/enclosure.php?id=972>

Global fish passage forum to include first symposium on hydropower and fish

Peter Starr

The American Fisheries Society and the Environmental and Water Resources Institute of the American Society of Civil Engineers are holding this year's annual fish passage conference in Australia in December in collaboration with hosts Charles Sturt University and the New South Wales Government. The International Conference on River Connectivity in Albury from December 10 to 14 includes the First International Symposium on Hydropower and Fish Management.

<https://fishpassage.umass.edu>

The latter is scheduled to be chaired by Luiz Silva, a Brazilian freshwater fish scientist now based at the university's Institute for Land, Water and Society in Albury, located at the headwaters of the Murray River which forms part of the largest river basin in Australia. Dr Silva has contributed significantly to the understanding of fish passage in tropical regions and is credited with developing strong links to the hydropower industry in Brazil.

The overall conference is scheduled to be jointly chaired by Lee Baumgartner, associate professor at the Institute, and Matthew Gordos, fish passage manager at the New South Wales Department of Primary Industries.

Global significance

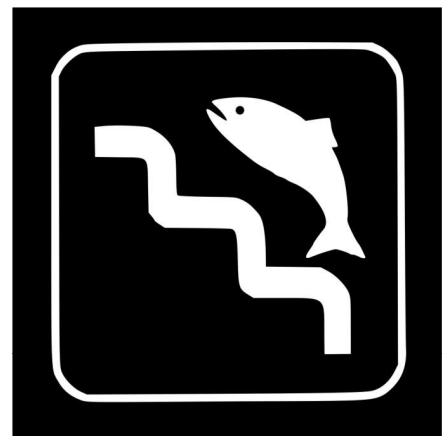
The separate symposium is part of an initiative of the Technology Collaboration Programme on Hydropower of the Paris-based International Energy Agency (specifically its working group on hydropower and fish, known as

Annex XIII). According to the conference website launched by the University of Massachusetts during the second week of January "there is an increasing goal worldwide to seek multidisciplinary tools and solutions for the hydropower development and fish management nexus.

Hydroelectricity is a major economic activity, especially in developing countries, but also a major threat for the aquatic biota, especially fish. In many cases, the lack of knowledge on the ecology of fish species affected by dams is the main factor constraining the ability to provide more informed decisions and management plans for hydropower."

The symposium is expected to focus on global issues related to hydropower and impacts on fish biology and ecology, bringing perspectives from different countries, especially those where such development is a major economic activity. The five main topics are:

- Hydropower dams and impacts on habitat availability for fish.
- Hydropower structures/operation and direct impacts on fish.
- Hydropower monitoring and management for fish.
- Design, development and monitoring of mitigation measures.
- Hydropower policies and decision-making.



Relevance to Mekong Basin

Dr Baumgartner, one of the two co-chairs of the conference, said organisers were aiming for strong attendance from the Mekong region.

"River development will greatly impact aquatic resources and water use in the Lower Mekong Basin," he told Terra Daily.

"Current hydropower output of about 3,325 MW is expected to rise seven percent per year over the next two decades with the construction of 134 new dams. Irrigation networks are expected to expand by more than 250 percent over the same period. This growing number of large-scale water resource development projects in the basin is challenging the long-term sustainability of the world's most productive inland fishery."

The Australian freshwater fish ecologist currently leads a five-year project on quantifying the biophysical and

community impacts of improved fish passage in Laos. The project - financed by the Australian Centre for International Agricultural Research (ACIAR) - was launched in 2016. "The Lower Mekong capture fishery is extremely important," Dr Baumgartner said.

"It contributes more than 50 percent of the animal protein and supports the livelihoods of close to 70 million people living in the basin. But river development threatens this productivity. "

"In South America, similar development in the Amazon River depleted fisheries production by 70 percent. In North America, the Columbia River salmon fishery also collapsed following dam construction. To partly restore the associated fisheries, \$7 billion was invested from hydropower earnings into applied research over 50 years." Dr Baumgartner said these cases highlighted how robust science was needed to identify, evaluate and mitigate the effects of river development.

"It is far cheaper to do so before investing in water resource development rather than responding to subsequent fish declines after construction has taken place," he said.

"Without effective mitigation strategies, capture fisheries production will fall substantially, impacting a major source of animal protein and income."

The conference in Albury in December follows a regional gathering organised by ACIAR and the United States Department of the Interior in Vientiane in 2016 in which a wide range of experts working in the Lower Mekong discussed fish passage issues for the first time. The conference provides a forum to raise these issues on the international stage.

According to Dr Baumgartner, the December conference will bring together international experts in riverine development, fish passage and aquatic ecosystem management to show how research can be applied to enhance global policy and decision-making.

"It's open to government agencies, developers, researchers, local provincial and district leaders and natural resource managers as well as recreational fishers to help share knowledge of successes and opportunities for sustainable fisheries," he said.

"The broad aim is to ensure economic development is furthered while maintaining, and where necessary, restoring healthy fisheries."

Initially known as the National Conference on Engineering and Ecohydrology for Fish Passage, the annual gathering of experts was hosted by the University of Massachusetts, Oregon State University and the University of Wisconsin between 2011 and 2014 as well as in 2016 and 2017. The first conference outside of the United States was in the Dutch city of Groningen in cooperation with various European organisations in 2015.

The conference call for abstracts opens on February 1 and closes on April 30. Readers interested in being placed on the mailing list for the conference should contact Dr Baumgartner directly (lbaumgartner@csu.edu.au).

The author is editor of Catch and Culture - Environment, the fisheries and environment research and development newsletter of the Mekong River Commission.

International Workshop on Rehabilitation, Propagation and Conservation of Mahseer, April, India

An international workshop on mahseer conservation, propagation and rehabilitation will be held in Bhimtal, India from 23-24 April 2018. The workshop is organised by the ICAR-Directorate of Coldwater Fisheries Research in collaboration with the Coldwater Fisheries Society of India.

Despite their abundance at one time in India and other Asian nations, wild mahseer populations have been declining because of degradation of aquatic ecosystems, urbanisation and indiscriminate fishing. Mahseer are presently struggling for their mere existence in different lakes and rivers of the Indian sub-continent. Depletion of broodstock has severely affected the availability of healthy seed for its sustainable management. Therefore, captive rearing, breeding and propagation of mahseer are necessary challenges for the fishery scientists and other stakeholders to address.

In view of the aforesaid facts, an international workshop on Charting the Innovative and Strategic Paths for Rehabilitation, Propagation and Conservation of Mahseer will be convened with an aim to discuss researchable issues and to build a strategic action plan for sustainable management of mahseer in fisheries and aquaculture.

Eminent scientists from India, England, Thailand, Malaysia, Sri Lanka, Bangladesh, Nepal and Bhutan will deliver lead talks on key issues during the workshop.

For more information including contact details, please download the brochure below:

<https://enaca.org/enclosure.php?id=973>

International Workshop
on
Charting the Innovative and Strategic Paths for Rehabilitation, Propagation and Conservation of Mahseer
23-24 April, 2018

Organized by
ICAR-Directorate of Coldwater Fisheries Research, Bhimtal-263136, Nainital, Uttarakhand, India

In collaboration with
Coldwater Fisheries Society of India

World Brackishwater Aquaculture Conference, 23-25 January 2019, Chennai, India

BRAQCON 2019 will provide a unique platform for people involved in brackishwater aquaculture and fisheries, nationally and internationally. Sharing of experience and research advancements in the frontier areas would facilitate maximum utilisation, cultivation, conservation and development of aquatic resources. The conference would elicit interest among young researchers and scientists to undertake studies and research to further open up new blue growth avenues for a better world. BRAQCON 2019 is also an attempt to foster cooperation between concerned governmental, non-governmental institutions, private sector and farmers for advancement of sustainable aquaculture and fisheries in brackishwater ecosystems.

The conference would cover latest research and development in the broader themes of the conference in the form of special sessions, contributed papers, expert group discussions and brainstorming on issues facing aquaculturists and ecosystem managers in India and around the world. The following are the themes of the conference:

- Brackishwater ecosystems.
- Brackishwater and estuarine biodiversity and conservation.
- Aquaculture production systems.
- Reproduction and larviculture.
- Fish and shellfish nutrition.
- Aquatic environment and climate change.
- Aquatic animal health.
- Socio-economic and livelihood issues of fisheries and aquaculture.
- Aquaculture genetics and biotechnology.

Side events will include the Farmers Conclave 2019 where industry participants can share their views with policy makers and researchers and an 'Aquaculture start-up meeting', aimed at entrepreneurs planning to enter the



industry and allied sectors wishing to present ideas, innovations and technologies.

For more information please visit the BRAQCON 2019 website:

<http://www.ciba.res.in/braqcon/>

Offshore Mariculture Asia 2018, 15-17 May, Singapore



The 8th Offshore Mariculture Conference will be held in association with the U.S. Soybean Export Council, USSEC, in Singapore, from May 15 - 17, 2018.

In the last European edition of the conference in Barcelona, it was highlighted by the FAO chairman that Asia is the hub in terms of quantity and potential, and it needs to intensify with more fish per cubic metre of water. The market in Southeast Asia is now well-primed for large scale/large volume production and the focus for this first Asian edition of the conference will be marine fin fish.

The conference has previously enjoyed six successful conferences in Europe, held in Malta, Alicante, Dubrovnik, Izmir, Naples and Barcelona. This March launched the 7th edition in the Americas in Ensenada, Baja California, Mexico in response to the need to grow this important sector worldwide to meet the growing demand for seafood. This highly successful launch, supported by both regional and federal Mexican governments, saw 200 attendees from 20 countries and included high profile investors.

The 2018 Offshore Mariculture Asia Conference will be an invaluable platform for networking as it will provide ample opportunities to meet and network with fellow delegates, sponsors, and speakers to knowledge share and move the sector forward.

The conference will consist of 2 days of technical presentations and panel discussions from high level experienced operators in the sector. The event concludes with a technical visit to an operating farm, providing delegates with an insight into their inner workings.

Organised by Mercator Media Limited, publishers of World Fishing and Aquaculture, the conference will include the latest legislation, investment and financing opportunities together with the day to day practicalities of running an offshore business.

To register or obtain more information please visit the Offshore Mariculture Asia 2018 website: <http://www.offshore-mariculture.com/asia>

Video lectures: Regional Training Course on Culture-based Fisheries in Inland Waters



Participants in the Regional Training Course on Culture-based Fisheries in Inland Waters.

As foreshadowed in the last issue, video recordings of lectures from the Regional Training Course on Culture-based Fisheries in Inland Waters are now available for download, or you can view online at:

<https://enaca.org/?id=939>

The course was held at Nha Trang University, Vietnam, from 30 October to 8 November 2017. The objective of the course was to provide participants with the skills to assist local communities to plan and manage culture-based fisheries.

The lectures include presentations on:

- Hydrobiological characterisation of water bodies for culture-based fisheries development.
- Assessment of production potential.
- Bioenergetic modelling.
- Stocking calendar, size, density and seed transport.
- Species selection.
- Multiple-use of water resources in culture-based fisheries.
- Community consultation.

- Legal and policy framework for culture-based fisheries development.
- Gender mainstreaming in culture-based fisheries.
- Constraints to culture-based fisheries development.
- Fish stock dynamics.
- Harvesting and marketing strategies.
- Case studies from China and Vietnam.

The course was sponsored by the **United Nations University Fisheries Training Programme (UNU-FTP)**.

Youth and Fish Drawing Competition Art Book

This Souvenir Book reproduces the winning entries from the Youth and Fish Drawing Competition for Thai junior and senior high school students that was held during the 6th Global Symposium on Gender in Aquaculture and Fisheries (GAF6) in Bangkok, 4-7 August 2016. The competition was organised by the Faculty of Fisheries - Kasetsart University, the Network of Aquaculture Centres in Asia-Pacific and the USAID Oceans and Fisheries Partnership. This was the first activity involving youth in raising awareness of the gender dimension to be conducted at a GAF event.

The Youth and Fish Session was born out of the need to help raise awareness, through art in schools, of gender in aquaculture and fisheries. In her introductory speech to the event, Dr Arlene Nietes Satapornvanit, Gender Specialist at the USAID Oceans and Fisheries Partnership, said "we believe that we should start our advocacy about gender awareness and sensitivity at a young age, so that these concepts will be ingrained in the mind-set of the youth, and they will keep and carry it on until adulthood. That being gender sensitive is not only a one-time activity but a lifestyle. The youth are the future leaders and if we have leaders who are gender sensitive, we can be assured that there is inclusivity in their actions, and that no one will be left behind." The Youth and Fish Session was considered a pilot activity and it is hoped that this could be expanded to other countries in the region in the future.

Ten senior and seven junior high schools participated, with two students (male and female) from each school. They were accompanied to the venue by their parents and teachers. The competition ended after nearly three hours of drawing and painting.



The organisers would like to acknowledge the panel of judges for their time in looking at all the entries. The students produced beautiful and meaningful art and the judges faced a challenge in choosing the winners. Congratulations to all the students, schools, teachers and parents for their participation and support. The event was supported financially by the Network of Aquaculture Centres in Asia-Pacific.

An electronic version of the book is available for download from: <https://enaca.org/?id=937>

Report of the Sixteenth Meeting of the Asia Regional Advisory Group on Aquatic Animal Health

This report summarises the proceedings of the 16th meeting of the Advisory Group, held 26-27 August 2017 in Bali, Indonesia. The group discussed:

- Progress in NACA's Regional Aquatic Animal Health Programme.
- OIE standards and global issues.
- Listing of diseases in the Quarterly Aquatic Animal Disease Report.
- Regional disease status, including of shrimp, finfish, amphibian and molluscan diseases, and listing of Tilapia Lake Virus (TILV) in the quarterly disease report system.
- Reports on the aquatic animal health programmes of partner agencies.
- Disease reporting and revision of the Quarterly Aquatic Animal Disease List.
- Developments in antimicrobial resistance.



The Advisory Group meets annually to provide advice to NACA member governments on aquatic animal health management. The group's role includes reviewing disease trends and emerging threats in the region, identifying developments in global aquatic disease issues and standards, evaluating the Quarterly Aquatic Animal Disease Reporting Programme and providing guidance on regional strategies to improve aquatic animal health management.

The report is available for download from the NACA website at: <https://enaca.org/?id=975>

FAO-NACA expert workshop on newly emerging aquaculture practices

Aquaculture production is an indispensable source of protein food for human consumption in the world as a whole. It is particularly important in the developing countries for national socioeconomic development apart from food production role it plays. Despite a slowdown in its annual growth rates in recent years, aquaculture remains one of the fastest growing food production sectors and is expected to continue to expand into the foreseeable future. The general trend in aquaculture development is going towards a higher level of intensity in terms of material and management inputs, coupled with advances in sophistications in aquaculture technologies and production operation system development.

Over the years there have been new development and innovations in aquaculture farming systems and culture facilities, resulting in the improved efficiency in natural resources uses and the rearing conditions and quality of farmed aquatic species. In recent years, relatively new farming systems, technologies and business integration models have been increasingly adopted in commercial aquaculture production, such as the recirculating aquaculture system, in-pond raceway aquaculture system, high efficiency aeration systems and the integration with other farming or non-farming operations.

The new development in the direction of further diversified aquaculture farming systems and rearing facilities point to the need to review of the currently practiced aquaculture farming systems for comparison with the farming system classification in current use by FAO and other international organisations for aquaculture statistical purposes. The comparison would reveal the gaps in illustrating the aquaculture development status and trend between the statistical data structured by the existing classification and the farming systems in real use.

To address these issues, FAO and NACA will convene a technical workshop of selected aquaculture experts to:

- Review and develop a summary of the currently practiced conventional aquaculture farming systems, newly

emerging farming systems as well as potential novel farming systems with promising future.

- Compare the aforesaid farming systems summary with the farming system classification in current use by FAO and other international organizations for aquaculture statistical purpose.
- Identify the major gaps in illustrating the aquaculture development status and trend between the statistical data structured by the existing classification and the farming systems in real use, with a focus on the usefulness of aquaculture data structured by farming system for the purpose of debunking the interactions of aquaculture development with these factors, including the use of natural resources (mainly land and freshwater), dependency on artificial feeds, energy use, the extent of financial requirement for investment and operation, environmental concerns and potential risks.
- Develop a category with structured hierarchy of aquaculture farming systems classification to suit the need of flexible categorization of aquaculture statistical data in the collection, storage and reporting at national and international levels.

The workshop will be held in June; the venue will be announced in due course.



Network of
Aquaculture
Centres in
Asia-Pacific

Mailing address:
P.O. Box 1040,
Kasetsart University
Post Office,
Ladyao, Jatujak,
Bangkok 10903,
Thailand

Phone +66 (2) 561 1728
Fax +66 (2) 561 1727
Email: info@enaca.org
Website: www.enaca.org

NACA is a network composed of
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Asia-Pacific Region.



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