ISSUE 29

DECEMBER 2019

ASIAN FISHERIES SOCIETY

e-Newsletter

MESSAGE FROM EDITOR

Wishing all the readers a very Happy and Productive 2020.

AFS celebrated its 35th Foundation Anniversary along with 12th AFAF in the Philippines during 2019 and is going strong with various activities in different fields. Gender in Aquaculture and Fisheries Section of AFS has been very active during the year and through a Memorandum of Understanding established its Secretariat in Kerala University of Fisheries and Ocean Studies (KUFOS), at Kochi, India. As indicated in last newsletter, the Asian Fisheries Social Scientists Research Network (AFSSRN) is being reinvigorated with 154 members to date. It is planned to organise the first AFSSRN Forum in Iloilo, Philippines during first quarter of 2021. Announcement of exact dates and program will be available soon.

AsiaPacific-FishWatch in collaboration with the Central Marine Fisheries Research Institute (ICAR-CMFRI), India will be preparing profile information on three economically important marine species – Cobia, Indian Pompano and Pink-ear Seabream.

Fish Health Section AFS will be organising the 11th Symposium on Diseases in Asian Aquaculture (DAA11) in Kuching , Sarawak, Malaysia and is scheduled for 23-27 August 2020.

It is very painful to announce the demise of Pro. Edgardo Dizon Gomez, a friend of AFS and an exemplary coral reef scientist from the Philippines. Prof. Gomez has been actively involved with the activities of AFS and has been on its Council in the past. We pray for his soul to rest in peace. His brief bio is in this issue of newsletter.

M. V. Gupta
Editor

Inside this issue:

AFS PRESIDENT MESSAGE

Dear AFS Colleagues,

Greetings!

How fast time flies and it is December once again! It is time to reflect on the highlights of 2019.

The first quarter of 2019 was a busy time for the preparation for the 12th Asian Fisheries and Aquaculture Forum, which was held on 8 to 12 April 2019 at Iloilo Convention Center in Iloilo, Philippines. It was a successful event organized by AFS in partnership with the University of the Philippines Visayas (UPV) and the University of the Philippines Visayas Foundation, Inc. (UPVFI). The 12AFAF was also significant because within the forum was the AFS celebration of its 35th year of foundation. Detailed reports on these events are available in this issue.

We are also happy with the new look acquired in 2019 of the Asian Fisheries Science, an open access SCOPUS indexed publication of the Society. With more submissions this year, it continued to keep its regular schedule of publication in March, June, September, and December.

This year, AFS membership has increased to 774 by 5 December 2019 from 650 on 31 December 2018. In July last year, the Permanent Active Member (PAM) category was launched and to date, we have 78 members. Hopefully, the Society will have more PAM in 2020, particularly coming from those who are up for membership renewal. The 13th AFS Council is pushing for the organizational membership. We expect that the guidelines for this will be released next year.

The AFS MyConferences was migrated to a new website and was given a new look. The AFS MyConferences provides information on all the conference activities of the Society to guide the hosts of future fora and conferences run by the Society and to ensure consistent high standard and quality in all AFS conferences. The new site is https://www.afsconferences.net/my-conferences/.

We look forward to a better next year. The 11th Symposium on Diseases in Asian Aquaculture (DAA11) will be held in 2020 in Kuching, Sarawak, Malaysia. The DAA, which has evolved into the biggest aquatic animal event in Asia, is returning to Malaysia where the FHS-AFS was founded in 1989. Also, preparation for the conferences organized by AFS or its Section will start or continuing: 4th International Symposium on Fisheries and Aquaculture Education (ISAFE4) in 2021 (Taiwan), 8th Cage Aquaculture in Asia (CAA8) in 2021 (China), 8th Global Conference in Aquaculture and Fisheries (GAF8) on 2021(India), and 13th Asian Fisheries and Aquaculture Forum (13AFAF) in 2022 (Taiwan).

The 54th Council Meeting to be attended by the 13th Council Members will be held in Jakarta, Indonesia. It will be hosted by the Agency for Marine Affairs and Fisheries Research.

I wish everyone a happy and blessed 2020! Thank you.

ALICE JOAN DE LA GENTE FERRER
President 13th AFS Council

NEWS FROM THE GENDER IN AQUACULTURE AND FISHERIES SECTION

As 2019 draws to a close, we would like to report three activities that have been our priorities since the June AFS e-Newsletter – completing outputs from our last Conference (GAF7 in October 2018), preparing for our next conference (GAF8) and starting a new gender dialogues project, organised through AFS and GAFS. In addition, we announce that GAFS has now signed a formal Memorandum of Understanding with the Kerala University of Fisheries and Ocean Science, India.

On regular matters, GAFS sends out monthly e-mails called *Keeping Up to Date with GAF*, containing research updates and news items, and runs very active social media outreach via Facebook (https://www.facebook.com/AFS-Gender-in-Aquaculture-and-Fisheries-181176555231544/) and Twitter (@Genderaquafish). We welcome you to follow us online!

GAF8 – 8TH Global conference on gender in aquaculture and fisheries

Save the dates 6-9 April 2021 and plan to come to Kochi, Kerala, India for GAF8!

Following an open advertisement, the Gender in Aquaculture and Fisheries Section (GAFS) selected the Society of Fisheries Technologists (India) (SOFTI) in collaboration with the ICAR-Central Institute of Fisheries Technology (ICAR-CIFT) to be our co-organisers in conducting the 8th Global Symposium on Gender in Aquaculture and Fisheries (GAF8). We are already welcoming partners, the earliest of which is the Network of Aquaculture Centres in Asia Pacific (NACA).
Kochi, in southern India, is a location that has it all – fisheries, gender and cultural perspectives, as well as being well connected internationally.

GAF8 is being planned as a major forum for the exchange of new knowledge and to foment plans and action to capture the wave of increasing interest in gender in aquaculture and fisheries. Expect different formats and opportunities in 2021. On 26 November, in Kochi, the detailed planning started during discussions between Dr CN Ravishankar (President of SOFTI and Director of ICAR-CIFT), and Drs Meryl Williams and Nikita Gopal.

To share your ideas on GAF8 as planning starts, please contact us through E-mail: GAF8Conference@gmail.com

What this website for all updates: https://www.gafconference.org/

GAFS signs Memorandum of Understanding with the Kerala University of Fisheries and Ocean Studies, India

Following formal permission from the Government of Kerala, on 30 November 2019 in Kochi, Kerala, GAFS and the Kerala University of Fisheries and Ocean Studies (KUFOS) signed a Memorandum of Understanding (MOU). during the AQUABE 2019 international conference in Kochi. The MOU covers areas of collaboration and networking between KUFOS and GAFS and the location of the GAFS Secretariat at KUFOS.

Finalizing the outputs of GAF7

Due to the size of GAF7 and the mix of stages of development of all the presentations, posters and Special Workshops, we decided not to have a single journal special issue, but to acknowledge and encourage peer reviewed and other publications of the works presented and discussed. We are currently compiling a list of such publications. Two special publications are mentioned here, namely the full and comprehensive "GAF7 Long Report" of all presentations and workshops, and the Special Issue on Gender in Fisheries of the journal Gender, Technology and Development.

GAF7 Long Report: Expanding the Horizons

https://www.genderaquafish.org/gaf7-long-report-expanding-the-horizons/

This publication presents an overview of all presentations, special sessions and training workshops from the GAF7, held from 18-21 October 2018 at the Asian Institute of Technology, Bangkok. Here are some of the key GAF7 conclusions.

Strong evidence exists that when women are made visible and given voice, changes start to take place: but miracles don't happen overnight, most taking a long time. Change is impeded by many factors and the lack of sex-disaggregated data in fisheries make baselines and change hard to assess. Added to the data gap is actual resistance to integrating gender equality into the sector. Sex-disaggregated data, if available at all, rarely extend beyond production data, thus omitting valuable information on other parts of the value chain, especially post-harvest and support services in which women's participation is most prevalent. GAF7 presenters described their attempts to work around the lack of sex-disaggregated data by tapping into data inferred from a national fisheries census, institutional data and data collected by special studies. A panel-led discussion proposed empirical studies to work through model approaches, at the national level, for collecting sex-disaggregated data.

Despite the challenges of assessing change, a rich set of surveys and impact assessments provided GAF7 with rather sobering results. In Indonesia, several fisheries development assistance projects that were intended to include gender equality components barely did so; a survey of the seafood sector found women were indeed integrated into the sector but still experience many types of discrimination. In India, state and national fisheries policies overlook non-traditional women's opportunities; women have been replaced in many nodes of the shrimp value chain by mechanisation and export market orientation; and capacity building programs for fish processing are mainly driven by the top-down demands of importers.

Special Workshops explored gender indicators for small scale aquaculture certification and for monitoring the progress of implementing the Small Scale Fisheries Guidelines. Photovoice, a graphic image-based research tool for impact assessment and other social science research was taught in a Special Workshop and used by a team of participants in assessing GAF7.

Some change can be self-initiated, especially by women's collective action, of which GAF7 heard many fine examples from Africa (AWFISHNET), Asia (Bangladesh, Cambodia, Japan, Philippines and Thailand), the Caribbean and Mexico.

The impetus to progress toward gender equality comes from many quarters. GAF7 presenters and participants explored solutions like education for future experts and new gender-sensitive technologies that offer new opportunities such as in fish marketing in India, and to overcome emerging problems such as climate change impacts on seaweed and shrimp farming. Educators showed how, in India, Japan, Philippines and Thailand attempts to mainstream gender in fisheries education has met with passive, active, and hidden resistance from colleagues and/or administration. Thus it becomes necessary to mainstream gender in the academic curriculums of fisheries science. Institutions testing gender transformative approaches found that backlash to innovations to help women can be reduced by engaging women and men together as agents of change.

Fisheries and aquaculture are not monolithic, as reflected in studies that focused on women in particular industry nodes such as seaweed growing and tuna landing ports. Women's entrepreneurship was featured in "positive deviators" in Bangladesh, collectives in Japan, individual women's stories in Nigeria, small scale oyster growers in the Philippines, and, in India, women traders in competitive value chains, and by those balancing choices between fish and non-fish livelihoods.

Gender in Fisheries Special Issue of Gender, Technology and Development journal

See full story: http://dds.ait.ac.th/gds/2019/10/15/congratulations-to-the-gaf-fellowship-students/

In March 2020, a Special Issue of *Gender, Technology and Development* journal will be released, containing selected papers on the topic and a Guest Editorial, based largely on GAF7 presentations and discussion. In the next e-Newsletter, full details will be available.

GAF7 was held at Asian Institute of Technology (AIT), Thailand in October 2018. It has been agreed that part of the proceeds from GAF7 be converted to fellowships to support students studying gender in aquaculture.

We congratulate Ms. Nant May Than Htay (Myanmar), and Ms. Sujata Timelsina (Nepal) who were awarded the fellowships in October 2019. They enrolled in AIT in August 2019 and will be working on theses on gender in fisheries/aquaculture under the co-supervision of Dr. Salin Krishna and Dr. Kyoko Kusakabe, co-organizers of GAF7 from AIT Department of Development and sustainability.

Prof.Kyoko Kusakabe (left), Ms. Sujata Timelsina, Ms. Nant May Than Htay and Dr. Krishna R. Salin (right). Photo: Asian Institute of Technology.

Ms. Nant May Than Htay is enrolled as a graduate student at Gender and Development Studies, Thailand. Before joining AIT, she worked on many projects with organizations like National Young Women's Christian Association Myanmar and The Lutheran World Federation Myanmar in various positions such as mentor, facilitator, team leader, trainer, coordinator, and program secretary with a specialization in Women's Empowerment and Community Development.

Ms. Sujata Timelsina is enrolled as a graduate student in Aquaculture and Aquatic Resources Management. She is a fresh graduate of Fisheries Science and graduated from Agriculture and Forestry University (AFU), Nepal in 2018. Before enrolling at AIT, she worked with poor farmers especially women to raise different breeds of fishes in a scientific way so that farmers could optimize their production and gain higher economic benefits to improve their livelihoods condition.

New project - *"Dialogues in Gender and Coastal Aquaculture: Gender and the Seaweed Farming value chain"*

With funding support and methodology inputs from SwedBio of the Stockholm Resilience Institute of Stockholm University, GAFS has joined with partners in India and Kenya to implement a project on women in seaweed farming. Researchers from the Asian Institute of Technology and the Lagos State University, Nigeria will also be on the project advisory group.

In seaweed and other coastal aquaculture enterprises, women are locally relevant yet considered marginal in business and development, presenting challenges for creating dialogues among equals that enable the women's voices and concerns to be heard. Recognising this and the important role women play in seaweed farming, location-specific gender dialogues in seaweed farming, collecting and purchasing areas of Tamil Nadu, India, and coastal Kenya will explore viewpoints on who controls what resources and the political and economic relations that cause and are caused by the distribution of these resources. The gender dialogues aim to allow the participants to better understand the labour allocations for seaweed aquaculture and post-harvest, and provide a wider and hopefully joint understanding of livelihoods and the households' priority on labour distribution around production as well as reproductive activities. Deepening gender dialogues could help in defining good practices and in learning by practicing. Gender perspectives will also allow participants to understand better the access of different people to resources, particularly land/space. Attention will also be paid to markets as critical to the seaweed value chain, and as institutions embedded in the aquaculture political economy.

The project will be undertaken in 2020 and final reports are due in early 2021. The project's specific objectives are:

1. To find or create the motivation(s) at each site for holding the dialogues.

2. To promote engagement of fishers, farmers, researchers, policymakers, NGOs and industry representatives in participatory and interactive collaborations on gender and policy implications, including actors from outside the traditional fisheries/aquaculture field.

3. To elucidate how the impacts of globalized markets; small-scale fisheries guidelines implementations and contextualised institutions (formal and informal) determine conditions for exclusion and struggles of women at local levels.

4. To share views and experiences on how distribution of benefits and quality of participation affect social and economic advancement.

5. To indicate emerging areas of gender and environment policy inquiry.

The progress will be reported in future AFS e-Newsletters.

Keep in touch with GAF:

Website: https://www.genderaquafish.org/; https://www.genderequality.genderaquafish.org/
Facebook Page: https://www.facebook.com/AFS-Gender-in-Aquaculture-and-Fisheries-181176555231544/

Twitter: @Genderaquafish https://twitter.com/Genderaquafish

Contributed by Meryl Williams, Nikita Gopal, Kafayat Fakoya and Kyoko Kusakabe (on behalf of GAFS ExeComm)

ASIAPACIFIC-FISHWATCH NEWS

Announcing our first aquaculture species and 2019 update for all tuna species: In June 2019 we reported that we were planning to add more species, thanks to a new collaboration with the ICAR Central Marine Fisheries Research Institute of India (ICAR-CMFRI). To progress the collaboration, Meryl Williams met in Kochi at ICAR-CMFRI on 26 November in a meeting and video conference chaired by the Director Dr A. Gopalakrishnan. The video conference included senior experts at the Regional Centers at Mandapam Camp, Visakhapatnam and Vizhinjam Research Centres. The teams involved had been among those of ICAR-CMFRI that wrote the major 2017 book: "*Prioritized Species for Mariculture in India*" [Ref: Ranjan, R., Muktha, M., Ghosh, S., Gopalakrishnan, A., Gopakumar, G. and Joseph, I. (Eds.). 2017. *Prioritized Species for Mariculture in India*. ICAR-CMFRI, Kochi. 450 pp.]

At the November meeting, it was decided that the first step in bringing the key species profile information into AsiaPacific-FishWatch would be to commence with the biology profile pages for each of 3 species, namely Cobia (*Rachycentron canadum*), Indian Pompano (*Trachinotus mookalee*) and pink-ear seabream (*Lethrinus lentjan*), with the aim to complete these by the end of January 2020 and then to start on drafting the other profile pages for each of these species.

Cobia, *Rachycentron canadum*. Source: Ranjan et al 2017

We look forward to reporting progress as this collaboration develops.

Social media: AsiaPacific-FishWatch continues to be very active on social media outreach to a growing number of followers. AFS members can keep abreast of Asia-Pacific fisheries and aquaculture news by liking our Facebook page (https://www.facebook.com/asiapacificfishwatch), and following us on Twitter (@Asiapacfish, https://twitter.com/Asiapacfish).

We welcome suggestions and contributions for AsiaPacific-FishWatch. Please contact: asiapacfish@gmail.com.

Updated information: In February, we updated the status of stocks of the six tunas covered in the species pages (skipjack, yellowfin, bigeye, albacore, longtail and Pacific Bluefin tuna). See the species profiles at: http://www.asiapacfish.org/index.php/species. Our handy guide to users on where to find key information on tunas and tuna fisheries in the Western Central Pacific and Indian Oceans was updated and can be consulted at: http://www.asiapacfish.org/index.php/item/24-tracking-down-expert-knowledge-on-oceanic-tunas.

We welcome suggestions and contributions for AsiaPacific-FishWatch. Please contact: asiapacfish@gmail.com.

Contributed by Meryl J Williams, interim Director AsiaPacific-FishWatch **http://asiapacfish.org/**

AFS BRANCHES & SECTIONS

Asian Fisheries Society Indian Branch (AFSIB)

AFSIB initiated a funded project on 'Marine Fisheries Improvement' to be operated along the west and south east coasts of India, with a focus on sustainable fishery, particularly of the small pelagic fishes which contribute more than 50% to the marine fish catch. This project aims at mainly sensitizing the coastal fisher folk and other stake holders on the need to follow the guidelines and regulations set by the respective State Governments for ensuring sustainability of the fishery resources through responsible and informed exploitation practices. It also aims at sensitizing the fishers against illegal and destructive fishing activities which come under the IUU regime as per FAO. The project was formally launched on on 25th July 2019. Following launching, a series of awareness programmes have been initiated in different States of the west and east coasts. During the period under report six such programmes have been completed.

Brochures brought out in local languages were distributed to stakeholders during all the six programmes. Several more awareness programmes will be conducted in the maritime States during the year 2020.

Asian Fisheries Society Taiwan Branch (AFSTB)

Fig. 1. Technology product shows in this event

The "Taiwan International Fisheries and Seafood Show" (TIFSS 2019), jointly organized by Taiwan External Trade Development Council (TAITRA) and My Exhibition Co., Ltd. was culminated into a successful ending on September 28, 2019. The debut of the "Fishing Tackle exhibit area" gathered 16 domestics and foreign exhibitors including Daiwa from Japan, Abu Garcia from the United States, as well as famous Taiwanese fishing equipment suppliers, Okuma, Yu-Shang, Etuoh, Wefox, and Anten.

Other than the showcases of various fishing tackles, the exhibit areas also included the Seafood Process Area, Fishing Equipment and Technology Area, Seafood and Value added Seafood Area, Marine Biotechnology Area, and Aquaculture Area (the Fishery Area and the Cold Chain Area), which displayed the full chain of fishing industry.

The "World Aquaculture Techniques and Marketing Outlook 2019" seminar invited the Director of the Fisheries Research Institute of Kindai University to share the fishery history and current condition of the bluefin tuna in Japan. This Taiwan International Fisheries and Seafood Show integrated business negotiations, procurement, seminars and full range of activities to showcase the diverse development of the fishery industry in Taiwan. In this decade, technology is not only focused on practicality but also about sustainability to protect the environment. Local and International experts in aquaculture and fisheries (product and equipment) shared comprehensive knowledge on the current situation and future outlook of the aquaculture industry and how to have strong partnership for the final goals.

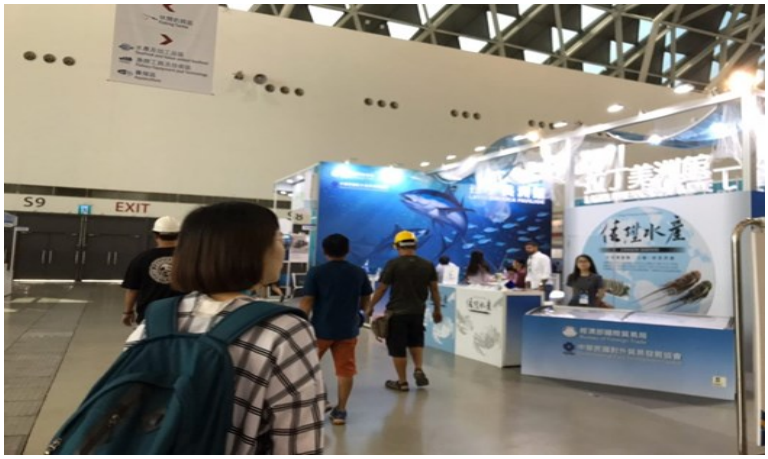


Fig. 2. Event in Kaohsiung exhibition

Aquaculture and Livestock Taiwan Expo 2019 highlighted "precision" business. A 3-day Aquaculture Taiwan and Livestock Taiwan Expo & Forum 2019 was held and organised by UBM Taiwan and Malaysia from 31st Oct to 2nd Nov. It featured technology-based and advanced industrial applications. According to Hexa Research's report, precision farming technologies is forecast to reach $43.4 billion by 2024. With the rising issues of climate change and over exploitation of fishing resources, the aquaculture business opportunity has expanded potentially as well as the development of IoT and biological technology. Aquaculture Taiwan aims to provide diverse solutions which help optimise and upgrade the industrial facility and increase aquaculture productivity.

https://www.taiwanfishery.com/en_US/news/info.html?id=A6F65A4071D341C3https://www.aquaculturetaiwan.com/en-us/News-And-Updates/News

Contributed by Professor Dr. Han-Jia Lin

Asian Fisheries Social Sciences Research Network (AFSSRN)

The AFSSRN has a new ratified by-laws as of August 2019.

The first Asian Fisheries and Aquaculture Social Science Forum (1st AFAFSSF) will be held in the first quarter of 2021 in Iloilo, Philippines. The election of the new set of officers will be conducted during the forum. The survey form for the scan of social science capacity in Asia was drafted and to be fielded in the first quarter of 2020. All abstracts of Social Science presentations in the 12 Asian Fisheries and Aquaculture Forum (1st AFF in 1986 to 12th AFAF in 2019) were collected by Dr. Alice Joan Ferrer for scanning of social science research work through the years, including topics, researchers, countries, institutes/organizations. This is in part of the work to scan social science capacity in Asia applied for Asian fisheries and aquaculture.

Active membership stood at 154 as of 5 December 2019 from 54 on 31 December 2018. Forty-five (45) AFS members with membership in AFSSRN were up for renewal this year. Reminder was sent through email to AFS members who did not renew their membership fees. All the renewing members were advised to make the payment using Paypal or Telegraphic Transfer (TT).

Those who are interested to enrol themselves in the network can send their message of interest to the Executive Secretary of AFS at info@asianfisheriessociety.org

Information provided by Dr Meryl J Williams

Fish Health Section (FHS)

The 11th symposium on Diseases in Asian Aquaculture (DAA11) marks the 30 years of AFS-FHS establishment and it will be celebrated in Malaysia. Local hosts, the Department of Fisheries Malaysia (DOF) under the Ministry of Agriculture and Agro-based Industry together with the Ministry of Modernisation of Agriculture, Native Land and Regional Development Sarawak (MANRED) will be organizing the event in cooperation with the FHS-AFS. DAA11 will be held from 29th September to 2nd October 2020 with the theme "***Land of Adventure: Exploring Aquatic Animal Health for Sustainable Aquaculture***". A comprehensive and ambitious scientific programme has been prepared which will include presentations by a range of knowledgeable speakers from around the region. Ample time is scheduled for networking, field trips, and social functions during the Symposium. Trade displays will be exhibited throughout the Symposium. DAA11 has introduced a 3-Minute Pitch(3MP) for each session and is an extended form of an elevator pitch that was introduced in DAA10 (2017). 3MP is a great exercise for all speakers to construct research findings and pertinent information into a 3 minute speech. It will expose researchers to initiate their ideas and share research discoveries in brief, simple and clear manner to wider audience.

We are now calling for online abstract submission. For more information about the symposium and online registration, please visit DAA11 website at http://www.daa11.org. For assistance, please feel free to contact our secretariat at daa11@dof.gov.my.

ASIAN FISHERIES SOCIETY'S 35TH YEAR FOUNDATION ANNIVERSARY

The Asian Fisheries Society (AFS) celebrated its 35th year of foundation on 10 April 2019 during the 12th Asian Fisheries and Aquaculture Forum at the Iloilo Convention Center, Iloilo City, Philippines. It was a night to look back at the journey of AFS since it was conceptualized in 1983 in Manila by seven fisheries scientists from Southeast Asia and its formal foundation in 1984 by fishery professionals as a non-profit scientific society. The celebration lasted for three hours with messages, dinner, entertainment of local songs and dances, and the awarding of certificate of appreciation to the former members of the AFS Council by the present AFS Council. A 7-minute video that encapsulated the journey of AFS in 35 years was shown. On behalf of the past AFS Councils, Profs. I Chiu Liau and Ida Siason gave messages that highlighted the purpose and relevance to current times of AFS and their wishes for the future of AFS. They also expressed their thanks for the invite, the celebration, and the appreciation they have received.

The mission of AFS is to undertake activities that will lead to the acceleration of research for the improved production and management of fisheries and aquaculture resources for sustainable benefits of present and future generations. The AFS is guided by the following objectives: (a) to promote effective interaction and cooperation among the scientists and technicians involved in fisheries research and development in Asia-Pacific with a view to encouraging and facilitating research activity complementation, sharing of information, capacity building and publication of research results; (b) to create and propagate an awareness of the importance and the ways of sustainable utilization, cultivation, conservation and development of aquatic resources in the region; (c) to promote the establishment of sections and local branches of the Society and national fisheries and aquaculture societies, and to seek affiliation and cooperation with societies, organizations and institutions having similar objectives.

In 35 years, the AFS has been nurtured by 12 AFS Councils (spanning years 1984 to 2019) by securing financial stability, organizing the triennial fisheries and aquaculture forum, increasing membership, and expanding its outreach. The 13th AFS Council (2019 – 2022) and the future councils will continue to nurture AFS to ensure its relevance and sustainability. The AFS holds a triennial forum since 1986. The Asian Fisheries and Aquaculture Forum (AFAF), formerly known as the Asian Fisheries Forum (AFF), is being held to promote scientific interaction among its members and the community. By bringing together aquaculture and fisheries scientists and stakeholders from the Asia-Pacific region, the forum provides a venue to discuss regional priorities, common problems, and research findings.

Each forum updates the participants of recent trends and on-going research results in the region. It provides a unique opportunity to learn and evaluate research and also provides the much-needed scientific advice to policymakers, managers, and planners. The forum has been convened 12 times to date, around the ASIAN region:

1st AFF	1986	Manila, Philippines
2nd AFF	1989	Tokyo, Japan
3rd AFF	1992	Singapore
4th AFF	1995	Beijing, China
5th AFF	1998	Chiang Mai, Thailand
6th AFF	2001	Kaohsiung, Taiwan
7th AFF	2004	Penang, Malaysia
8th AFF	2007	Kochi, India
9th AFAF	2011	Shanghai, China
10th AFAF	2013	Yeosu, Korea
11th AFAF	2016	Bangkok, Thailand
12th AFAF	2019	Iloilo, Philippines

Joining the current and former members of the AFS council in the celebration were the participants of the 12th Asian Fisheries and Aquatic Forum.

OBITUARY

Philippine National Scientist Edgardo D. Gomez, PhD

Edgardo Dizon Gomez, Founding Director, of the Marine Science Institute (formerly the Marine Science Center), Philippines, an exemplary leader, visionary academic and trail blazing coral reef scientist passed away at 81. He was a Member of Executive Council of AFS during 1985.

Dr. Edgardo Gomez received his bachelor's degree from De La Salle University in English and social science (*summa cum laude*). He then was awarded a Fulbright Scholarship at St. Mary's University in the US where he obtained his Master's in Biology. But he discovered his life's true passion while studying marine biology for his PhD at Scripps Institution at the University of California, San Diego.

In 1974, Dr. Gomez received his appointment as the Founding Director, of the Marine Science Center (now the Marine Science Institute -- MSI). Dr. Gomez quickly built up international reputation as a world class marine scientist, educator and leader. By the late 1970s, he had recruited and mentored a group young Filipino students, scientists and US Peace Corps Volunteers to help him to document the status of coral reefs on a national scale for the first time.

The results of this research project showed that many reefs in the Philippines were damaged and threatened, and provided the opportunity for Dr. Gomez to highlight the importance of coral reef science and conservation. By 1981, his leadership led to the Philippines hosting the 4th International Coral Reef Symposium and established the Philippines' coral reefs as a global focal point for reef studies. International groups became interested to invest in applied science projects (e.g. ASEAN-Australia Coastal Living Resources Project) and opened the doors for Dr. Gomez's young cadre of students to be trained in the best institutions abroad.

By 1983, recognizing the need for a coastal facility where MSI students and PhD researchers could carry out their studies, Dr. Gomez planned and built a world class marine lab right on the water in Pangasinan - the Bolinao Marine Laboratory (BML) which became a base for mentoring marine science students to become field ecologists and experimental scientists. It also became a base to grow high-value reef organisms, especially giant clams, sea urchins and sea cucumbers that Gomez's national survey had shown to be depleted.

By the early 1990s, Dr. Gomez's flock of young Filipino scientists came back with their PhDs, and were imbued with Dr. Gomez's vision to carry out world class science and improving lives in local communities. In fact, Dr. Gomez leadership emphasized "honor, honesty and excellence," but also with the commitment to always to do better for all. Students and colleagues will always remember that he required them to promise to maintain these values of service and world class standards. As a result of Gomez's leadership, in 1994, MSI was declared a National Center of Excellence in Marine Science by former President Fidel V. Ramos. After over 20 years of leading MSI, Dr. Gomez served as the exemplar for subsequent MSI Directors who were surrounded by a large group of colleagues and students committed to Gomez's goals.

In recent years, Dr. Gomez donated his marine science expertise to marine conservation and protecting the South China Sea islands of the Philippines. In 2014, Gomez was declared by former President Benigno Aquino to be a National Scientist of the Philippines, joining an elite group.

For most of his career Dr. Gomez quietly used his stock of giant clams to set up mini "nurseries" on reefs in many locations throughout the Philippines. Every time we see a giant clam in the sea, we should all remember our friend and mentor, Edgardo Gomez. Recently, he proposed using giant clams as a conservation icon for conservation of the reefs of the West Philippine Sea. He further suggested re-establishing populations of giant clams on these reefs and including them in an Asian Heritage Area for all humankind. Now our fearless Founding Director has found his peace. Perhaps if we all support these small steps for peace, we can make a giant leap for our planet and humanity.

See also : https://www.rappler.com/nation/246291-national-scientist-edgardo-gomez-dies

Contributed by: *Porfirio M. Aliño*

NEWS

Entries invited for global Aquaculture Award

The 2020 Aquaculture Awards have officially opened, allowing aquaculture companies from around the world plenty of time to prepare their entries and nominations before the 9 March 2020 deadline. The awards, which will be presented during the Aquaculture UK exhibition in Aviemore on 20 May, are designed to showcase the cutting-edge innovations, promote best practice and pay tribute to the industry stalwarts in the world's fastest growing protein production sector. Following the success of the 2019 Aquaculture Awards – which generated record numbers of entries from around the globe – they will be open to international contenders from all aspects of this global sector.

"The 2020 awards categories have been chosen to highlight excellence across the sector, from the contribution of individuals just starting in the industry, to the impact made by established multi-nationals which have an ability to improve food security around the world. The award categories include: (i) Best aquaculture company; (ii) **Finfish farmer of the year;** (iii) **Shellfish** farmer of the year; (iv) **Outstanding contribution to the industry; Environmental impact award;** Aquaculture supplier of the year; **Community** initiative; Economic sustainability; Animal Welfare; Innovation, etc.

To find out more about each of the categories and to enter or nominate please visit: www.aquacultureawards.com

Majority of global fishing subsidies 'harmful', report finds

Billions of dollars of damaging subsidies continue to be poured into fishing every year, despite governments agreeing long-standing goals to eliminate them. The money makes fuel cheaper and increases capacity so boats catch more fish. Analysts say the subsidies make fishing seem more profitable than it really is and are driving a global decline in fish populations.

In the most up-to-date and comprehensive survey of fishing subsidies produced to date and published in Journal Marine Policy an international team of scientists found that $35 billion of public money went into fishery subsidies in 2018. It classified $22 billion of that as harmful because it went towards increasing catch capacity. The analysis found that fuel subsidies represent nearly a quarter (22%) of all financial support provided to fishing fleets. Fuel subsidies are widely considered among the most harmful because they make it affordable for more vessels to spend the time at sea necessary to chase down dwindling fish populations.

The survey comes as negotiators at the World Trade Organisation (WTO) race against a self-imposed deadline to agree a way to scrap all harmful subsidies by the end of 2019. More than 90% of fish stocks are at maximum sustainable levels or overfished, according to the UN Food and Agriculture Organisation. Not all of the $35 billion public support for the fishing industry is harmful. Some of the cash – known as beneficial subsidies – pays for efforts to promote conservation and sustainable fishery management.

Then there are what are identified as ambiguous subsidies, which could in theory either help prevent or encourage overfishing, depending on the circumstances. Take for example a project launched in Bangladesh to support the livelihoods of fishers and other vulnerable people at difficult times. Implemented without care, such social safety net programmes could merely attract more people to fish the same waters.

The results showed that Asia offers the largest subsidies to its fleets. The continent contributed 55% of the global total, followed by Europe (18%) and North America (13%). China was the largest single contributor, making 21% of the global subsidy payments, followed by the USA (10%) and Korea (9%). Subsidies from China and Korea are mostly classified as damaging, while those from the US government tend to be beneficial. China has by far the world's biggest fishing fleet, with more than 270,000 vessels, and an annual catch of 18 million tonnes, according to a separate analysis of fishing subsidies published earlier this year by the International Institute for Environment and Development.

Source: https://chinadialogueocean.net/11585-majority-of-global-fishing-subsidies-harmful-report-finds/?fbclid=IwAR1Rfx1zOj9l3mlflFn5z_vBGOmvSdYpLC0Ui1G8UAr2PeXreNHVxXY3VuA#.XcnX8baFpA8.facebook

FAO teams up with Chinese experts to strengthen global aquaculture

The FAO and the Chinese Academy of Fishery Sciences (CAFS) agreed to strengthen cooperation and build the capacity and sustainability of fisheries and aquaculture in developing countries. The partnership will advance the transfer of technology and capacity development through the South-South Cooperation (SSC) and promote joint efforts to advance sustainable fisheries and aquaculture management, particularly in the Asia-Pacific region.

FAO see their agreement with the Chinese academy, as a valuable way to help to contribute significantly to improving the lives and livelihoods of communities in developing countries and help them achieve the UN Sustainable Development Goals amid the growing threat of climate change. Under the accord, FAO and CAFS will facilitate joint seminars and workshops, information exchange and technology transfers. The partners will support initiatives to promote climate impact mitigation and adaption and help build the resilience of fishers and others working in the sector, while strengthening efforts to increase the regulation and safety of fish products for regional and global trade.

Since FAO and China established the SSC Programme in 2009, experts from China have shared their knowledge and technologies with farmers in Africa and Asia to raise agricultural productivity and sustainability in areas including cereal production, animal husbandry, fisheries and aquaculture.

South-South - together with the Triangular Cooperation, which involves third countries and other partners - breaks the traditional dichotomy between donors and recipients and has been effective in creating jobs, building infrastructure and promoting trade.

Through this cooperation, FAO has facilitated exchanges of technical experience and know-how by fielding more than 2,000 experts and technicians to over 80 countries in Africa, Asia, Latin America, North Africa and elsewhere over the past 20 years.

Source: https://thefishsite.com/articles/fao-teams-up-with-chinese-experts-to-strengthen-global-aquaculture?dm_i=4P30,QHCB,380CDY,35IQ2,1

China will have to plug huge shortfall in fishery supply under new law

Chinese officials have reaffirmed an ambitious target to reduce fishing catch to 10 million tons from domestic waters over the next three years. The three million-ton reduction is a significant slice of the country's overall seafood output from freshwater and seawater sources and suggests efficiencies or imports – or both – will have to rise significantly. The statement was made during a national inspection tour of fishing ports by members of the Standing Committee of the National People's Congress, the country's main legislative body. The decision will likely mean China will import more seafood, given government has also been reducing the national aquaculture footprint through a stronger enforcement of environmental laws.

China produced 64.5 million tons of seafood in 2018, up 0.19 percent, of which aquaculture accounted for 49.9 million tons, up 1.73 percent on the previous year. Distant-water fishing contributed 3.5 percent of the total volume, at 2.25 million tons.

Depletion of China's natural fishery resources has become an urgent issue requiring a quicker and more serious reduction of the national catch total. Fuel price subsidies paid to domestic water fishery firms will this year be cut to 40 percent of the 2014 level.

Similarly, China has committed itself to retiring 20,000 fishing vessels from its domestic waters by 2020, a reduction of 1.5 million kilowatts. China is making efforts to update its Fisheries Law, first published in 1986.

Source: https://www.seafoodsource.com/news/supply-trade/china-will-have-to-plug-huge-shortfall-in-fishery-supply-under-new-law?fbclid=IwAR3gn2YXFimnCv5sv2EACRFtKSNaqa0Rz10xXxLx9Y8ZfDsfxjT_kn-hel4

China to build 300 mobile offshore fisheries

China is expected to build 300 mobile offshore fisheries with each having an annual output of 20,000 tons of high-quality seafood, announced the 20th Marintec China, one of the world's largest and most influential maritime exhibitions, held in Shanghai from Dec 3 to 6.

Currently, the China Shipbuilding and Ocean Engineering Design and Research Institute in Shanghai is leading the planning of the mobile offshore fishery project, and is preparing to tackle key research difficulties of deep sea breeding and processing vessels. The so-called "mobile offshore fishery" refers to a deep sea breeding industry chain including parent fish cultivation, juvenile fish feeding, adult fish farming, processing and sales. Each fishery needs a sea area of 3-10 square kilometers. Every five fisheries form a large mobile fishery group within which each fishery is 10-15 kilometers away.

On the offshore fishery, the deep sea breeding and processing vessel is of most advanced technology. Integrating the functions of breeding, replenishment, processing, storage, and transfer of high-quality and value-added fish species, the vessel adopts closed circulating water for fish farming for the first time. The comprehensive management and control system can effectively isolate foreign pathogens to protect the breeding system. And the ability of self-navigation enables it to quickly avoid severe sea conditions such as typhoons.

Shen Lan, China's first vessel for fishing Antarctic krill, which was designed by the institute and is to be delivered at the end of this year, is such a kind of vessel. Equipped with shrimp freezing and meat and powder processing lines, it can work in Antarctic waters for krill production when completed.

Source: http://english.eastday.com/Latest/u1ai8656048.html

Indonesia zoning plan hurts fishers, favours coal and oil, activists say

Environmental activists in Indonesia have slammed a proposed zoning plan for coastal areas in eastern Borneo that they say will hurt the livelihoods of local fishing communities in favour of the extractives and plantation industries.

The government of the province of East Kalimantan has for the past few years been drafting the plan, referred to as RZWP3K, with an eye to resolving land disputes in coastal areas and small islands. These conflicts typically pit local communities against mining, agriculture and tourism businesses, and part of the plan is to designate areas for fishing grounds, conservation and other maritime purposes.

The latest draft of the plan drew criticism from the People's Alliance for Maritime Justice, a coalition of environmental NGOs. The group's key objections are that the plan, as it stands, would unfairly benefit the coal and oil and gas industries; allow reclamation activities by property developers; and permit the building of infrastructure for large-scale logging and plantation activities.

In particular, the alliance says the draft plan calls for the development of roads and oil refineries across 752,180 ha (1.86 million acres) of land in the two coastal cities of Bontang and Balikpapan, Indonesia's oil hub. That development would involve reclamation activities in waters currently used by local fishing communities, the group says. The plan would also designate an area of 2.6 million ha (6.4 million acres) for fishing, but activists say this proposed zone is farther out to sea than traditional and small-scale fishers can reasonably reach. Also, the activists say, the zoning plan offers little in the way of assistance for the provinces fisheries sector, made up largely by traditional and small-scale fishers. It allocates just 25 hectares (62 acres) of land — an area smaller than 50 football fields — to resettle nearly 140,000 households from displaced fishing communities.

Source: https://news.mongabay.com/2019/12/indonesia-zoning-plan-coastal-kalimantan-borneo-fishing-coal-oil-gas/

India's marine exports to China touches $800 million; on course to cross

India's exports of marine products to China tripled in the first nine months of 2019 tripled and touched USD 800 million and is expected to cross the USD one billion mark this year, according to an official statement. The big push of marine exports to China were part of India's efforts to widen its export base to bridge huge trade deficit with the world's second largest economy, which last year climbed to USD 57 billion. India is the second largest aquaculture producer, 3rd largest fish producer in the world with exports of marine products worth USD 7 billion. China is a major importer of marine products with imports of around USD 12 billion. Massive efforts are being made by India in ensuring the quality of the products thereby earning a great reputation in the international market, the statement added.

Source: https://www.financialexpress.com/economy/indias-marine-exports-to-china-touches-800-million-on-course-to-cross-1-billion-mark/1749993/?fbclid=IwAR2301LM2tw34s-FZeqzCKFwEhXZxxEgT4oBZdlYtwBoR7_bvkckwL1oxL4

US ban on Indian wild-caught shrimp to cost fishermen USD 300 million

A recent report by the U.S. National Marine Fisheries Service has recommended the continuation of a ban on all wild-caught shrimp from India following an inspection that found a lack of turtle-excluding devices on vessels involved in the fishery. The decision came after the NMFS inspected the fishery and found it out of compliance with rules set by the U.S. State Department, which instituted a ban on imports from fisheries that don't do enough to protect sea turtles, including India.

The industry in India has protested the more recent decision, because the vessels that aren't using the devices are usually situated in areas where the presence of any sea turtles is negligible. The Marine Products Export Development Authority of India has, in response to the report by the NFMS, submitted comments trying to reverse the ban.

The ban could end up costing fishermen in Kerala, India, up to USD 300 million. While the vast majority of shrimp shipped to the U.S. are raised via aquaculture, thousands of fishermen in Kerala rely on exports of wild-caught brown, Karikkadi, and deep-sea shrimp for their livelihoods.

Source: https://www.seafoodsource.com/news/supply-trade/us-ban-on-indian-sea-shrimp-maintained-could-cost-hundreds-of-millions

AquaBounty's angst at "unnecessary" labelling law

A new law in the US would make it mandatory for the AquaBounty firm to flag up any products containing its genetically modified (GM) salmon. The company, which expects to harvest its first batch of GM salmon from its farm in Indiana in June 2020, believes that it is being unjustly targeted in the US government's new funding bill by a senator with an anti-GM agenda.

The firm goes on to assert the safety of their salmon from a consumer health perspective – as was confirmed by the FDA in 2015 – and claims that the new bill "imposes a mandate that targets a single company and product and calls into question the regulatory process and federal disclosure requirements".

Source: https://thefishsite.com/articles/aquabounty-angst-at-unnecessary-labelling-law?dm_i=4P30,QHCB,380CDY,35IQ2,1

A breakthrough for breeding Streptococcus-resistant tilapia

Benchmark has announced its discovery of a significant quantitative trait locus (QTL) for Streptococcus iniae resistance in Nile tilapia. Streptococcus infections are among the most critical disease challenges in tilapia production. Benchmark's genomic analysis from controlled disease resistance trials has shown that a significant proportion of the genetic variation for resistance is caused by a small region of DNA. Benchmark has made a patent application in relation to its discovery and the QTL identified will be used to select broodstock with high levels of *Streptococcus iniae* resistance for the production of commercial fry. Currently Benchmark selects broodstock for improved resistance to *Streptococcus agalactiae* using genomic selection, and for resistance to *Streptococcus iniae* by marker-assisted selection using the *S. iniae* QTL.

This is the first time that a significant QTL for disease resistance in tilapia has been identified and used for commercial breeding. It represents an important step forward in the genetic improvement of tilapia and in combating its most pressing disease challenges. Benchmark's commercial Spring Tilapia fry will be available to producers during early 2020.

Malcolm Pye, CEO of Benchmark, commented: "This is a major step forward for the tilapia industry. We have seen first hand how devastating Streptococcus is to the industry and with the introduction of this new technology we can drive significant productivity and sustainability improvements for our customers."

Morten Rye, director at Benchmark Genetics, commented: "This breakthrough in tilapia genetics is the result of many years of investment and commitment to bringing state-of-the-art breeding technology to this important farmed species. Today global tilapia production exceeds 6 million tonnes and we believe that this breakthrough will allow the industry to continue to grow to produce more of this cost effective, high-quality, protein source for humanity. Benchmark's Spring Genetics team is excited to be heralding in a new era in tilapia breeding".

Source: https://thefishsite.com/articles/a-breakthrough-for-breeding-streptococcus-resistant-tilapia?dm_i=4P30,M7Z0,380CDY,2LW6Z,1

Genes that could help tilapia breeders prepare for more intensive production

Two genes that might help tilapia producers to selectively breed fish that perform better under crowded conditions have been identified in a new study by researchers at the Centre for Sustainable Aquatic Research (CSAR) at Swansea University and could help to improve tilapia welfare at a time when production of the species – one of the most widely farmed finfish in the world - is becoming increasingly intensified. Fish domestication changes social behaviour and aggression is one of the key behaviours in crowded spaces. In the case of Nile tilapia high stocking density causes a shift from antagonistic (aggressive) to shoaling behaviour."

The researchers' hypothesis was that rearing density would influence the frequency of aggression – individuals with different aggression levels and stress-coping styles would differ in the expression of key genes involved in the stress response. In the process they identified two genes – known as sstl and fosab – that are related to the expression of stress in crowded environments.

Their research suggests that crowding inhibits aggressive behaviour in Nile tilapia and results in changes in the expression of stress-related genes that accompany the shift from social hierarchies maintained by agonistic interactions at low density, to shoaling at high density.

"This suggests that aquaculture can substantially alter the aggression level and stress response of Nile tilapia. Given that loss of aggression and stress tolerance are two of the defining features of animal domestication, and that our study shows that these were associated with differential gene expression in Nile tilapia, it might be possible to selectively breed fish that perform well under crowded conditions under aquaculture intensification," they conclude.

The full study, published under the title 'Transcriptomic response to aquaculture intensification in Nile tilapia' in the latest issue of Evolutionary Applications, can be accessed here: https://onlinelibrary.wiley.com/doi/full/10.1111/eva.12830

Source: https://thefishsite.com/articles/the-genes-that-could-help-tilapia-breeders-prepare-for-more-intensive-production

Device to Analyse Freshness of Fish

The Central Institute of Fisheries Technology, India has developed a simple, low-cost and easy-to-operate device to assess the freshness of fish in the market. The paper-based disc can be used on packed fish and shell fishes. The paper disc is attached inside the pack without coming in contact with the fish. This will absorb the chemical compounds released during the storage period and changes colour.

The colour change indicates the freshness of fish without any elaborate and costly laboratory tests. The cost of the test is nominal and will not affect the sale price of fish. This freshness indicator can be used on chilled, refrigerated and iced fish.

The test allows the monitoring of supply chains and the consumers will get better quality fish. Normally, the freshness of fish is either ensured by sensory attributes or by analytical methods, which is time-consuming, costly and not real-time.

In many instances, consumers who buy inferior quality fish come to know of it only while cooking or consuming. The availability of low-cost and easy-to-use device will help consumers get good quality fish, while it is helpful to traders to maintain better conditions to retain the freshness.

Source: https://www.thehindubusinessline.com/economy/agri-business/cift-develops-device-to-analyse-freshness-of-fish/article30390360.ece#

Indian Fishermen welcome Marine Fisheries Policy

Indian fishermen have welcomed the recently drafted, Marine Fisheries (Regulation and Management) Bill, 2019, which transfers power from the states to the Centre, to provide permits to fishermen in the exclusive economic zone between 20 and 200 nautical miles. The fishermen said that the bill would help draft uniform policies for fishermen across all states along the coast and benefit Maharashtra with the conservation measures enlisted therein. "No Indian fishing vessel shall engage in any fishing or fishing-related activity within the exclusive economic zone of India or the high seas, except with a permit issued by the central government or any authority notified under this Act for fishing, and shall be subject to such conditions and restrictions as prescribed," read the bill. For long now, fishermen have been demanding that the number of permits is uniform for bottom trawlers who carry on fishing in the deep seas and purse seine net fishermen.

"In Maharashtra, the stock of pelagic fish like grouper fish, sardine, mackerel, pomfret and pink perch has reduced drastically due to overfishing by bottom trawlers. Mostly the catch along the state coastline is juvenile fish which is restricting the growth of the fish population. The move by the Centre will help regulate overfishing by bottom trawlers," said Ganesh Nakhwa, president of the Maharashtra Purse Seine Net Fishermen Welfare Association.

Among others, the bill proposes notifying management plans for fishing on a regular basis, related to conservation of endangered species and mitigating pollution. According to the Central Marine Fisheries Research Institute, Bombay Duck, found in northern Maharashtra, has declined significantly in the last three years, while Indian mackerel has reduced up to 44 per cent as compared to 2017.

"We hope that the measures and restrictions enlisted in the bill are implemented effectively, as the state has failed to curb overfishing of juvenile fish," said Damodar Tandel, president of the Akhil Maharashtra Macchimar Kriti Samiti.

Source: https://www.asianage.com/metros/mumbai/110819/city-fishermen-welcome-marine-fisheries-bill.html

Campaign Against Shark Fin Trade Pays Off

The shark-fin market worldwide has been shrinking since 2013, thanks to the awareness campaigns by environmental NGOs against its consumption, Kim Friedman, Senior Fishery Resource Officer, Food & Agriculture Organisation (FAO), has said. Shark fins are one of the most expensive seafood items with a value ranging between $50-650 a kg, depending on the species. Internationally traded fins end up mostly in soups that find markets in China, Hong Kong and Singapore.

The delicacy of fins has been popular particularly in China, but a nationwide conservation campaign in that country witnessed an 80 per cent drop in consumption over recent years, Friedman said. The declining market in fins is a positive sign for conservation, as sharks are a vulnerable species that needs stringent conservation measures. This allows marine resource managers to put more effort in managing the trade in other consumable shark products that include meat, cartilage, drug supplements, oils etc, and non consumable products like teeth, jaws, skin, and rostra, he added. India, which is one of the major shark fishing nations and a signatory to CITES, has also brought in controls to ban export and import of shark fins. The government also prohibited removal of shark fins on board a vessel from the seas and calls for landing of the whole fish, he said.

However, the introduction of regulation has not always halted trade, and also resulted in rise in illegal sales of shark fins across the world. The situation would benefit from greater investment in awareness campaigns among fishermen and traders on how best to manage fishing and exports to a level that conserves the productivity of these species in the long term, he added. The FAO member countries have developed a response to these issues as part of an International Plan of Action for the Conservation and Management of Sharks with guidelines to nations engaged in shark fishing to participate in the conservation of shark resources in a sustainable way and minimise wastes and discards.

Source: https://www.thehindubusinessline.com/economy/agri-business/campaign-against-shark-fin-trade-pays-off/article28749832.ece

Hope for ASEAN's Threatened Biodiversity

The Asean region's relentless campaign to conserve and protect its rich but highly threatened biodiversity and ecosystems took center stage with the recent International Conference on Biodiversity hosted by Thailand. The event highlighted the conservation collaboration among the 10 Asean member-states—Brunei Darussalam, Cambodia, Indonesia, Lao PDR, Malaysia, Myanmar, the Philippines, Singapore, Thailand and Vietnam. The Asean region occupies only 3 percent of the world's total area, yet its mountains, forests, rivers, lakes and seas are home to almost 20 percent of the world's known plant and animal species as assessed by the International Union for Conservation of Nature.

The region is endowed with a diversity of forests, marine areas, oceans and wetlands. Many Asean member-states share common biodiversity-rich boundaries, possessing rich natural and cultural resources that provide a variety of ecosystem services, such as provision of food, clean air and potable water; regulation of natural processes like decomposition of wastes, nutrient cycling, and pollination of crops and other plants; as well as providing spiritual and cultural significance.

All these biodiversity and ecosystem services are key to the survival, development, well-being and prosperity of some 650 million Asean citizens. The Asean region has been experiencing rapid economic growth and modernization. It is known to be the world's fifth largest, and Asia's third-largest economy with a gross domestic product (GDP) valued at approximately $2.8 trillion in 2017. This is almost four and a half times the GDP value in 2000, which is valued at $615 billion.

However, along with this economic advancement comes escalating consumption and ever-increasing threats to biodiversity, such as pollution, terrestrial and marine debris, land conversion, irresponsible mining, illegal wildlife trade, and the introduction and proliferation of invasive alien species.

Source: https://businessmirror.com.ph/2019/07/15/a-message-of-hope-for-aseans-threatened-biodiversity/

Rattled By Sardine Stock Crash, India Begins Regulating Its Fisheries

Fishing has transformed over the decades from a small-scale artisanal practice into an increasingly industrialized sector. The widespread adoption of mechanized boats helped hike India's fish catch from an estimated 0.53 million metric tons in 1950 to 3.83 million metric tons in 2017. Until recently, this growth was largely unregulated, leading to over-capacity of fishing boats, inter-state conflict, and overfishing of some species. But as yields have slowed in the past decade, including an unexpected crash in the sardine catch, India's coastal states have begun to take measures to make fishing more sustainable. Some are also pressing for better national regulation.

In recent years, some states have introduced rules to extend the national ban on fishing during the monsoon — the one notable pre-existing policy instituted to let fish spawn as well as improve fishermen's safety. Some new state rules also regulate gear to reduce indiscriminate fishing. These include controls on the mesh size of nets as well as outright bans on practices like bull trawling. Southern states are also instituting rules on the minimum legal size of fish to reduce the catch of juveniles before they can spawn and replenish the population. The government has good reason to regulate this sector: it supports 4 million people, of which almost 1 million are active fishers. India's tropical oceans host a great diversity of fish — more than 400 species may appear in one trawl haul — and officials estimate the annual catch could grow to as much as 4.4 million metric tons. Marine exports crossed $7 billion in 2017-2018, up from just $5 million in 1971. Crisis is what prompted the southwestern coastal state of Kerala to lead the way in this spate of new fisheries regulations.

The Indian oil sardine (Sardinella longiceps) is a staple food in this state and a mainstay of its fishing industry. Catch of this small fish boomed through the 2000s, driven by intensified fishing. The fish had also expanded its range northward due to warming waters, giving other states a bigger catch than before. But after a record-high catch of 390,000 metric tons in 2012, sardine landings in Kerala plunged to 45,000 tons in 2016.

Scientists commissioned to study the problem found that the crash was caused mainly by environmental factors, including an El Niño one year, but also by overfishing. Fishers constantly exceeded the maximum sustainable yield of the fishery between 2010 and 2013, the scientists found, and were catching an increasing number of juvenile fish. The crisis prompted the Kerala government to implement a range of measures, beginning with a ban on fishing juvenile sardines in 2015. The sardine catch started rebounding in 2017, which many observers attributed to these measures.

In 2017, new laws set up a system of village and district councils of fishermen, scientists and officials to manage local-level fisheries. The state also amended the laws to get control over net manufacturers at the factory level, and expanded restrictions on catching juveniles to cover 58 species of fish, up from 14 species. The sardine crash prompted changes beyond fishing regulations in Kerala. It had led to a bust in the Indian fishmeal industry in the southern states of Karnataka and Tamil Nadu; sardines are used in high-quality fishmeal supplied to the aquaculture industry. Demand from expanding fishmeal plants helped drive overfishing of sardines. After the crash, larger fishmeal companies formed an association and committed to following minimum legal size standards in procuring fish.

Source: https://www.eurasiareview.com/14072019-rattled-by-sardine-stock-crash-india-begins-regulating-its-fisheries-analysis/

Start of Latest Mekong Dam Draws Fears of River's 'Tipping Point

Critics of the 1,285-megawatt Xayaburi hydropower dam in northern Laos fear recent upgrades to the controversial project won't be enough to save the Mekong River from a critical tipping point when it starts churning out electricity at full throttle next month. After seven years of construction, it will be the first of 11 dams planned for the river south of China — which has built 11 dams across the Mekong already — to go online. Some 50 million people downstream rely for a living on the river's waters, along with the fish and sediment it washes their way. Researchers and environmental advocates say the dam could block both.

"With this year's drought and the contribution to lower river levels from the cumulative effects of upstream dams holding back water, I think that the so-called ecological tipping point of the Mekong might have already arrived; if not, it's certainly fast approaching," Brian Eyler, a senior fellow at the Washington-based Stimson Center who heads the research group's Mekong Policy Project, told VOA.

The river runs more than 4,000 kilometers from China's Tibetan plateau through Myanmar, Thailand, Laos, Cambodia and Vietnam to the South China Sea. In June, the Mekong River Commission, a multinational body monitoring the river, reported one of the lowest water levels on record. At the same time, in the middle of the region's rainy season, Thailand's northeast suffered its worst drought in a decade..

To assuage critics' fears, the Lao government and the dam's developer, Xayaburi Power, redesigned parts of the project, "applied the best technology in the world" and spent $633 million on new fish ladders alone to help fish swimming upstream get past the dam.

The MRC secretariat, after reviewing the redesign, said in January that the changes were likely to help, but added that it could not tell by how much because the company had not shared enough data or documents. Eyler said the gates built into the dam to let river sediment through could work in theory. But the more they stay open, the less power the dam can generate. He was doubtful the Xayaburi could generate enough power to sell the amount of electricity it has promised Thailand, its main customer, and also let enough sediment pass to keep the Mekong basin properly replenished.

As for the upgraded fish passages, he said they were modeled on rivers with lower migrating fish volumes and may or may not be able to handle the larger numbers that typically swim through the site of the Xayaburi. "It's so tragic that the fate of these downstream countries are essentially left to the role of the dice on whether these untested mitigation efforts will work," Eyler said.

Short of scrapping the project, he said the developers could have tempered the risks by building the dam farther upstream, where it would block fewer migrating fish, or along a tributary, where, if designed right, it could deliver just as much power.

Source: https://www.voanews.com/east-asia-pacific/start-latest-mekong-dam-draws-fears-rivers-tipping-point

Chinese Initiatives Threaten Mekong River

On the sandy banks of the Mekong River, local fisherman Mana Suttawong stitches together the ropes on a worn-out net, his hands chafed from years of pulling in hefty catches on the legendary waterway. But the days of big hauls are gone for the 54-year-old, and the downsized fishing nets are a telling sign of diminished supplies. "In the past we used 16 cm and 14 cm, but now we only use 10," Suttawong explained, referring to the size of the squared stitching in the net.

Water levels vary along the river because of the chain of seven hydropower dams along the Mekong, controlled primarily in China.

A surge in demand for electricity from China and its South East Asia neighbours has altered the river landscape. Now, an economic plan could deliver even more damage to an already fragile ecosystem that helps support some 284 million people relying on the river and its tributaries for their livelihood, primarily through fishing and farming.

China's Belt and Road Initiative promises to improve regional trade routes including the expansion of the Mekong, using explosives to blast the rocks and sandbars along a 1.6 kilometer stretch to make way for large 500-ton Chinese riverboats.

Environmental protests put the plan on hold last year, but despite evidence of impending harm to fish breeding grounds and farmland, many of the activists fear the expansion will proceed. "The biggest problem from the dam is the unusual level of the water and its impact on the ecosystem," said Niwat Roikaew, Founder of Rak Chiang Kong environment group. The second issue is the sediment - rich organisms get trapped in the dam system, disrupting the river's biodiversity.

The environmental testing is a contentious issue, as critics point out the Thai government allows Chinese companies to complete their own research, a process some say is not entirely transparent. "We need to research for the positive and negative benefits first, but the Thai government just lets the Chinese survey for the geology, rocks, ecosystem and economic values first," Roikaew said.

There are currently 11 proposed large hydropower dam sites on the Mekong River's lower mainstream and 120 tributary dams that pose a threat to the ecological health and economic vitality of the region, according to a study released by the Mekong River Commission earlier this year.

Source: https://www.voanews.com/east-asia-pacific/chinese-initiatives-threaten-mekong-river

Vietnam Sets Up National Steering Committee on IUU

Việt Nam has implemented groups of solutions according to the EC's nine recommendations in abolishing the yellow card warning the EC imposed on Vietnamese seafood for failing to make progress in fighting illegal, unreported and unregulated (IUU) fishing. Việt Nam has set up a National Steering Committee on Illegal, Unreported and Unregulated (IUU) Fishing Prevention and Control to facilitate direction on this issue from central to local levels.

In addition, 28 coastal provinces and cities have also set up offices of inspection and control at fishing ports and implemented circulars and decrees under the Fisheries Law 2017, especially solutions against illegal exploitation. Thereby, control of fishing vessel operations and seafood output at ports is implemented well to serve traceability and collection of fishing records. With the drastic participation of the Ministry of Defence and localities, illegal fishing Is expected to be solved.

Source: SAMUDRA News Alert 20 September 2019

MSC and Indonesia join forces for sustainable fishing

The Indonesian Ministry of Marine Affairs and Fisheries (MMAF) and the Marine Stewardship Council (MSC) signed a memorandum of understanding (MoU) focused on increasing the accessibility of the MSC's market-based program to fisheries in Indonesia. The agreement covers cooperation in the development of fishery improvement projects (FIPs), sharing of sustainable fishing best practice using the MSC 's Fisheries Standard, and capacity building. Indonesia has some of the world's richest and most productive marine ecosystems. The country is the second largest fish producer in the world and fish products account for 54 percent of the national protein intake.

Because of the importance of Indonesian fish stocks to domestic and global food security, livelihoods, and marine biodiversity, the Indonesian government has been working with local and international stakeholders to overcome some of the challenges facing wild-capture fisheries, such as overfishing. The MSC Fish for Good project, which focuses on Indonesia, Mexico, and South Africa, supports efforts to promote more sustainable fishing practices and actively works with the Indonesian government, small scale fisheries, and local and international stakeholders in this effort. "MMAF and the MSC share the vision that sustainable fishing is essential to supporting coastal livelihoods, economic growth, and social development. This MoU shows our commitment to work together towards safeguarding Indonesia's seafood supplies for future generations," said Caleo. More than 300 fisheries in 34 countries are certified to the MSC's standard. The fisheries have a combined annual production of close to nine million metric tons, representing close to 15 percent of global marine harvest. More than 36,000 seafood products worldwide carry the MSC blue ecolabel.

Source: https://www.seafoodsource.com/news/environment-sustainability/msc-and-indonesia-join-forces-for-sustainable-fishing

World must adapt to 'inevitable' climate change, warns report

Nations rich and poor must invest now to protect against destructive climate change impacts already in the pipeline or pay an even heavier price later, a global commission led by former UN head Ban Ki-moon warned. Spending $1.8 trillion across five key areas over the next decade would not only help buffer the worst impacts of global warming but could generate more than $7 trillion in net benefits, the report from the Global Commission on Adaptation argued. "Global actions to slow climate change are promising but insufficient," the report concluded. "We must invest in a massive effort to adapt to conditions that are now inevitable. "Investing now in early warning systems, climate-resistant infrastructure, mangrove protection, better agriculture and improving fresh water resources would pay for itself several times over, it said. Mangroves protect, for example, against storm surges and act as nurseries for commercial fisheries, but at least a third of them globally have been uprooted for tourism or aquaculture. Without action by 2030, Ban told journalists, "climate change could push more than 100 million people in developing countries below the poverty line".

"People everywhere are experiencing the devastating impacts of climate change," said Microsoft founder Bill Gates, co-chair of the report along with World Bank CEO Kristalina Georgieva. It was long seen as an issue only affecting poor and developing nations. But recent massive inland flooding and a string of record-breaking hurricanes in the United States, along with ferocious heatwaves in Europe and Japan, have shown that wealth is not an adequate shield. "This is not just in the developing world but the developed world too," said Dominic Molloy, a co-author of the report from Britain's Department for International Development. But a new focus on adapting should not detract from the need to slash carbon pollution, he added. "We absolutely need to do both, reduce emissions and adapt," Molloy told AFP. "The purpose of this commission was to raise the visibility of adaptation, not shift away from mitigation." Failure to curb the greenhouse gas emissions slow-roasting the planet has already unleashed a crescendo of deadly heat waves, water shortages and superstorms made more destructive by rising seas. Earth's average surface temperature has gone up 1C since the late 19th century, and is on track -- at current rates of CO2 emissions - to warm another two or three degrees by century's end. The 2015 Paris Agreement calls for capping global warming at "well below" 2C, and 1.5C if possible.

The report's $1.8 trillion adaptation price tag for the period 2020-2030 is not an estimate of global needs, covering only warning systems and the four other areas identified. The $7.1 trillion dividend is based on the World Bank calculation that the value of damage caused by climate change is increasing, averaged across the globe, at about 1.5 percent per year. "If we delay mitigation any further, we will never be able to adapt sufficiently to keep humanity safe," said Christiana Figueres, a report commissioner and former head of the UN forum for climate change negotiations.

Source: https://www.philstar.com/world/2019/09/10/1950645/world-must-adapt-inevitable-climate-change-warns-report

US Names South Korea as Illegal Fishing Nation

The United States made a preliminary decision in September 2019 to designate South Korea as a country that engages in illegal, unreported, and unregulated (IUU) fishing, calling on Asia's fourth-largest economy to adopt tougher regulations. It marks the second time for South Korea to be designated as a preliminary IUU fishing country after the European Union made a similar decision in 2013, which was lifted in 2015.

South Korea has been applying tougher regulations on overseas fishing after being designated as an IUU country in 2013, fining violators 1 billion won (US$823,000).

The U.S. National Oceanic and Atmospheric Administration (NOAA) raised a question over South Korea's lack of efforts to forfeit unlawfully-raised profits earned by the problematic boats in March. Responding to the U.S. claim, the ocean ministry in Seoul said it plans to make legal grounds to confiscate any profits raised from illegal operations. South Korea also vowed to implement "zero-tolerance" polices on local fishing boats. "We plan to have the revised rules on deep-sea fishing be passed in parliament within this year," an official from the ministry said.

Last month, the U.S. acknowledged that South Korea has been making notable progress in improving its regulations, but the preliminary designation was inevitable, citing a "matter of timing," the ministry official added.

Source: https://en.yna.co.kr/view/AEN20190827005500320

First-ever estimate of commercial fishing gear lost in the world's oceans

Abandoned, lost or otherwise discarded fishing gear or 'ghost gear' contributes substantially to global marine pollution responsible for wide-reaching environmental and socioeconomic impacts. Until now there has not been a clear global picture of the quantity and type of fishing gear lost worldwide.

Using data from 68 studies published between 1975 and 2017, researchers have produced the first global estimate of commercial fishing gear losses in our oceans. "The study estimates that 6% of all fishing nets, 9% of all traps, and 29% of all lines are lost or discarded into our oceans each year," explains Kelsey Richardson, a Ph.D. student from CSIRO's Marine Debris Team, who led the study. "The type of fishing gear used, along with how and where it is used, can all influence gear loss by fisher gear becoming ensnared on the seafloor, and gear interfering with other gear types are the most common reasons for commercial fishing gear being lost."

The study, published in *Fish and Fisheries*, also found that reporting of commercial fishing gear lost at sea has increased through time. This is most likely due to improved reporting procedures and increases in the number of studies on gear loss across geographic areas and fisheries.

"These new global estimates on fishing gear losses fill a critical knowledge gap. By understanding where and why gear is lost, we can help target interventions to reduce fishing gear ending up in our oceans," says Dr. Denise Hardesty, Principal Research Scientist with CSIRO's Oceans and Atmosphere.

Currently, much of the data on gear loss is from the United States and Europe, highlighting the need for more information about gear losses in the African, Asian, South American and Oceania regions

Source: https://phys.org/news/2019-09-first-ever-commercial-fishing-gear-lost.html

Chinese assist Sri Lanka to locally produce fish bait for multi-day fishing

The project involves the capture of squid, which is used as a bait for multi-day deep sea fishing in the international seas, 200 nautical miles from Sri Lanka. In addition, it was revealed that the country can earn a large income by catching fish required for the canned fish industry. At present, about 700 local multi-day trawlers leave for international fishing and each vessel carries at least 6 tons of bait for one trip. Fishermen spend about Rs. 300 per kilogram of imported bait. The government also provides a tax concession of Rs. 50 per kilogram of imported bait. The new project can provide bait at half the price at Rs. 150 per kilogram to the fishermen.

This will enable the government to save billions of rupees of foreign exchange annually, and the government would be able to spend a large sum of money, which is now lost to the government as a tax concession, for the welfare of the people.

The Minister of State said it will be a big achievement that through the proper implementation of this program a bigger harvest of fish can be reaped for export and the people could easily obtain quality fish at very low prices.

Source: http://www.colombopage.com/archive_19B/Sep21_1569079332CH.php

Seafood packaging, made from shellfish

Scottish biotech company CuanTec's bioplastic "CuanSave" is formulated from chitin that has been extracted from the shells of shellfish left over after processing.

Food waste and marine plastic pollution are two of mankind's most pressing concerns . One innovation with the potential to have a positive impact in both areas is a new type of chitosan-based bioplastic that offers a much greener alternative to those conventional plastic films that can't be recycled. It also offers the significant benefit of adding longer shelf-life to food products.

Developed by Scottish biotech company CuanTec, the product, trademarked "CuanSave," is formulated from chitin that has been extracted from the shells of shellfish left over after processing – mainly langoustines caught in Scottish fisheries. It is antimicrobial, with the ability to extend the shelf-life of fresh fish by up to 40 percent, the company claims.

Therefore, as well as providing a ready-to-go circular economy by giving a value to what would have been a waste material while also taking single-use plastic out of the food system, it helps protect the food that's on sale and reducing the waste going to landfill. Commercial production of the bioplastic is now just a few months away with the initial focus on farmed salmon products. To help CuanTec progress to pilot production scale and finalize its formulations, the company recently secured funding from Sky Ocean Ventures and Scottish Enterprise. T

At the end of 2018, Waitrose, which is committed to making all of its own-label packaging recyclable, reusable or home compostable by 2023, entered into a partnership with CuanTec to test the packaging on its food products, with a view to introducing it to some of its fish.

Source: https://www.aquaculturealliance.org/advocate/plastic-2-ocean-seafood-packaging-made-from-shellfish/?utm_source=Informz&utm_medium=email&utm_campaign=Informz%20email

Vietnam targets 65 percent growth in marine aquaculture industry

Vietnamese officials have announced plans to substantially increase the size of its marine aquaculture sector. The country's marine aquaculture sector has been growing by 20% every year since 2010 and produced 431,600 tonnes of fish and shellfish, from an area of 258,000 ha, in 2018.Barramundi are one of the species currently produced in the seas around Vietnam.

Despite this rapid growth the Ministry of Agriculture and Rural Development has drafted a marine aquaculture strategy for the period up to 2030. According to the Vietnam Plus website, the ministry aims to increase annual marine aquaculture production to 710,000 tonnes by 2020 – an increase of 65% compared to 2018 levels.

By 2030 it aims to expand to 1.75 million tonnes, from an area covering 300,000 ha, including 30,000 ha of offshore production. In terms of value the ministry believes that exports from the sector will be worth US$4 -6 billion.

Source: https://thefishsite.com/articles/vietnam-targets-65-percent-growth-in-marine-aquaculture-industry

Can probiotics make shrimp farming more environmentally friendly?

A new study demonstrates that using probiotics when producing white shrimp larvae – not just in the grow-out stage – can help reduce emissions of greenhouse gasses and other pollutants.

An article in the journal *Aquaculture* has linked probiotic use in juvenile *Vannamei* shrimp production to reduced emissions of environmental pollutants like nitrogen and phosphorous effluents and carbon dioxide. The article also suggests that probiotic use is linked to reduced water and energy consumption during larval production.

Using probiotics in shrimp farming can reduce environmental pollutants and reduce farm costs. The researchers concluded that probiotics could improve the economic and environmental viability of larval production. Even though probiotics can come with high up-front costs, using them can offset other expenses for antibiotics or water purifiers. Probiotic use can also reduce chemical contamination of both the larvae and the surrounding environment.

Source: https://thefishsite.com/articles/can-probiotics-make-shrimp-farming-more-environmentally-friendly

UN report recommends replacing meat with seafood to limit global temperature rise to 1.5 C

UN panel states that increasing food production in the ocean is a key strategy in reaching the climate goal set in the Paris Agreement. Both aggressive health campaigns and carbon tax on beef are recommended means of achieving this goal.

"The report highlights that aquaculture is part of the solution to our climate challenges. It underlines that increasing food production in the ocean and changing diets away from terrestrial animal-based protein towards plant and ocean-based option is critical for our climate. It is also good for our health" says Cermaq's CEO Geir Molvik.

The report identifies five opportunities for action, and like the Opportunity report launched by the UN GC Action Platform for Sustainable Ocean Businesses, ocean-based energy, ocean-based transport, and fisheries and aquaculture are at the centre.

Source: https://thefishsite.com/articles/un-report-recommends-replacing-meat-with-seafood-to-limit-global-temperature-rise-to-1-5-c

Benchmark merges genetics firms

Akvaforsk Genetics and SalmoBreed have merged to establish Benchmark Genetics Norway in a move that aims to strengthen the company's ability to deliver sustained genetic improvements and support aquaculture producers to increase quality, yield, health and welfare. CEO of Benchmark Genetics, Jan-Emil Johannessen, says: "To create an even stronger organisation, we have merged the group's two Norwegian genetics companies. This strategic move also strengthens our position in the Norwegian and international markets."

"Our objective is to be at the forefront of R&D in genetics for the aquaculture industry. That is why it is important to create a cross-functional and international knowledge centre to support our strategy of delivering sustained genetic improvement to the aquaculture sector," says Johannessen.

The merged company is headquartered in Bergen, and the enterprise number of SalmoBreed AS (983 506 925) is retained for the new entity. Going forward, the company will continue to provide Atlantic salmon ova and advanced genetic improvement services and build upon the combined knowledge of the teams of experts in internal and external R&D projects. Benchmark Genetics Norway will maintain the brand names SalmoBreed and Akvaforsk Genetics.

Source: https://thefishsite.com/articles/benchmark-merges-genetics-firms

A targeted alternative to antibiotics?

Bacteriophages offer a novel sustainable alternative to the use of antibiotics in aquaculture, according to Proteon Pharmaceuticals – a start-up that's looking to break into the commercial aquaculture sphere.

They kill bacteria through a process called lysing in which they attach to the bacteria, inject their DNA and force the bacteria to reproduce their DNA until it explodes the cell wall of the bacteria. Although they are comparable to an antibiotic, in that they directly kill bacteria, an antibiotic is like a nuclear bomb and kills everything, meaning the microbiome has to repopulate itself and there's collateral damage to commensal bacteria, while a bacteriophage kills a specific species of pathogenic bacteria.

Phages are a natural part of the microbiome, but a concentrated cocktail of specifically selected bacteriophages can be used to kill specific diseases or bacteria. The bacteria we've targeted can cause high mortalities in aquaculture but phages can treat this swiftly. Our product can also be used prophylactically by forward-thinking farmers looking to prevent mortalities.

We can either use a particular phage or cocktail to target particular bacteria, such as a *Salmonella* or *Pseudomonas*, or we can develop a cocktail to target a whole range of bacteria. We're currently targeting *Pseudomonas* and *Aeromonas* – which are responsible for a large proportion of pond aquaculture disease outbreaks in India, for example – but we also have a product for vibrio in the pipeline for the shrimp sector and we also have a series of developments focusing on other bacterial targets like *Renibacterium*.

Our first product, Bafador, kills *Pseudomonas and Aeromonas* and is aimed at sectors including salmon, rainbow trout, carp, eel and catfish. It was only launched this spring and the response from producers has been even better than we expected, with early adopters including Arctic char and rainbow trout farmers.

The phages are mainly in the feeds, but also via immersive bath treatments and can be used in a variety of production systems – in both fresh and salt water.

The regulatory environment for phages really varies from market to market, so it's a bit of a challenge, but it's registered as a feed additive in Asia at the moment, and you can also use it as part of an autogenous vaccine. The field results have confirmed our trials that it reduces mortalities by over 80 percent – it basically stops a disease event in its tracks and, typically, there is no reoccurrence.

Source: https://thefishsite.com/articles/a-targeted-alternative-to-antibiotics

Non-profit weighs up futuristic fish options

The need to better understand the future of aquatic foods – including the opportunities related to the likely rise of lab-grown fish – is the focus of a new agreement between WorldFish and the International Food Policy Research Institute (IFPRI). The memorandum of understanding outlines how the two organisations will work together to generate research and policy recommendations to support a sustainable transformation of food systems through a range of aquatic foods. These include fish, molluscs such as mussels and clams, plants like seaweed, and "synthetic" fish produced in laboratories. Finless Foods, a start-up from MIT, has already produced lab-grown fish.

"Lab-grown beef is rapidly emerging as an alternative to farmed beef, and some companies are already working on lab-grown fish meat," said Dr Gareth Johnstone, Director General of WorldFish Centre. "As major suppliers of fish to the developed world, there are many uncertainties as to the impact of synthetic fish meat on the millions of fish producers, processors, entrepreneurs and others in the fish value chain in the developing world.

"The new research collaboration with IFPRI - one of the world's leading policy institutes - will help better understand these and other impacts as supply and demand for conventional fish in the developed world changes. It will mean we can be sure our research supports development of robust global, regional and national policies and make sure aquatic foods are part of the sustainable food systems of the future, and that developing countries play a big part."

Under the agreement, work will involve policy and foresight analysis to increase the contribution of aquatic foods to healthy and nutritious diets, livelihoods, inclusive economic development, gender equity and women's empowerment. It will also look at the prospects for improved use and management of water in both aquatic and terrestrial ecosystems, whilst ensuring these ecosystems are also resilient to the effects of climate change, as well as a range of other activities.

Source: https://thefishsite.com/articles/non-profit-weighs-up-futuristic-fish-options

Algae detection system aims to help aquaculture bloom

A Scottish consortium is developing an early-warning detection system for potentially dangerous plankton and algae, which could help the aquaculture industry tackle one of the biggest challenges to fish health. The group – comprising of marine technology provider OTAQ, the Iain Fraser Cytometry Centre (IFCC) at the University of Aberdeen, the Scottish Aquaculture Innovation Centre (SAIC), and CENSIS (the Innovation Centre for sensor and imaging systems and Internet of Things technologies) – is creating a low-cost sensor system that can automatically sample, identify, and count specific microscopic organisms using imaging analysis.

Algal blooms have been responsible for some of the worst instances of farmed salmon mortalities in recent years. Algae and plankton build-up is a major issue in aquaculture – some types of the organisms are toxic to salmon and others, in large quantities, can cause fatal gill damage. Algal blooms, the rapid growth of algae, can occur when there are significant changes to temperature, light, or nutrient conditions. In 2019, a particularly severe case in Norway led to the loss of a substantial number of fish. Current methods used for monitoring plankton and algae numbers are laborious, relying on readings manually taken once or twice per day. The results are also open to individual interpretation and error. Even some of the more accurate approaches rely on expensive and high-maintenance equipment that only provide a snapshot of algal levels.

Using microscope camera technology and a unique water sampling tool, OTAQ's new system will use artificial intelligence (AI) deep learning to process images and provide a near real-time reading for fish farmers. The producers can then take preventative measures, such as the activation of a 'bubble curtain' or barrier to protect a stretch of water or stop feeding salmon when necessary. The system is expected to enhance fish wellbeing and better safeguard stocks, improve the use of feed, as well as helping to make the entire water quality monitoring process more efficient and cost effective for producers. OTAQ said several companies have already expressed an interest in the new technology.

Source: https://thefishsite.com/articles/algae-detection-system-aims-to-help-aquaculture-bloom

FAO backs regulatory overhaul for global seaweed growers

More work needs to be done to understand the global seaweed industry, according to United Nations delegates who were attending the recent FAO Sub-Committee on Aquaculture in Trondheim. The call was made after a presentation from Scottish Association for Marine Science (SAMS) scientist Professor Elizabeth Cottier-Cook and five other international experts at the event. The seaweed industry was valued at around US$12 billion in 2017, and supports millions of families worldwide. Seaweed production grew globally from 13.5 million tonnes in 1995 to 30 million tonnes in 2016; as a food, seaweed is a source of nutrients, vitamins and omega-3 fatty acids, but it is also used globally in the food processing industry, as a thickening agent.

Prof Cottier-Cook, who leads the Global Challenges Research Fund (GCRF) GlobalSeaweedSTAR research project, told delegates at the meeting how this rapidly expanding industry faces a number of key challenges including disease and pest outbreaks, which can lead to whole farms being shut down. Following the presentation, key messages from the expert panel included; a call for the seaweed industry to be scaled up, both at the country and local farm level, alongside initiatives to address the lack of specific policies and guidelines for seaweed biosecurity. Work already undertaken by the GlobalSeaweedSTAR project, a four-year UK Research and Innovation (UKRI) funded programme to improve the sustainability of the global seaweed industry was presented at the side event and the team hopes to work with the FAO to develop a biosecurity action plan for this industry.

Prof Cottier-Cook, who has previously authored an international policy brief in association with the United Nations University on safeguarding the sustainable development of the seaweed industry, said: "Although, seaweeds have been grown for many years in Asia, production of seaweed has grown exponentially over the past 30 years and is now increasing being grown in countries with no tradition of consuming seaweed for food.

"The recommendation by member states at the Trondheim meeting that 'aquatic plants', which include seaweed, should be included in the development of their Progressive Management Plan for Aquaculture Biosecurity is a huge step forward for the industry, which currently suffers from pest and disease outbreaks and the risks associated with introducing non-native species."

Source: https://thefishsite.com/articles/fao-backs-regulatory-overhaul-for-global-seaweed-growers

IFPRI Study: Fish farming pulls 20 lakh out of poverty in Bangladesh

More than 20 lakh of the 1.80 crore Bangladeshis who escaped poverty between 2000 and 2010 managed to do so because of aquaculture, said International Food Policy Research Institute (IFPRI), raising the need for the government to give this area of agriculture special focus. The massive expansion of aquaculture in Bangladesh was a "blue revolution", said the Washington-based organisation in a book "The Making of a Blue Revolution in Bangladesh: Enablers, Impacts, and the Path Ahead for Aquaculture".

The book is the first comprehensive survey of the primary fish value chain in Bangladesh. Fish production in Bangladesh soared in the past 20 years, driven mainly by aquaculture, fish production increased from 30 % in 2000 to 47% in 2015. During the period, the sector grew at an estimated 8.6 percent. Production rose from 498,000 tonnes in 2000 to 17 lakh tonnes in 2015.. The results of this study suggest that the impacts of aquaculture growth on income distribution and poverty reduction in Bangladesh have been substantial, even though the impact on households in the bottom income quintile have been modest, said the IFPRI in the book's synopsis.

Aquaculture's contribution to income growth between 2000 and 2010 was 2.11 percent, including both price and quantity effects," which translated into an estimated poverty reduction of 1.7%. Although the estimates seem small, they represent a large share of overall poverty reduction between 2000 and 2010: from 48.9% to 31.5%. "This implies that the growth in aquaculture has been responsible for almost 10 percent of the overall poverty reduction in Bangladesh during the first decade of the 21st century." "Bangladesh is an excellent case study for the role of fisheries in food security" said the report.

The book "The Making of a Blue Revolution in Bangladesh: Enablers, Impacts, and the Path Ahead for Aquaculture" can be downloaded at: "The Making of a Blue Revolution in Bangladesh: Enablers, Impacts, and the Path Ahead for Aquaculture" can be downloaded at: http://ebrary.ifpri.org/utils/getfile/collection/p15738coll2/id/133348/filename/133558.pdf

Cambodia Faces Possible Food Crisis: 'Water But No Fish'

For centuries, Cambodians have looked to Tonle Sap, the largest freshwater lake in Southeast Asia and provides Cambodia with 500,000 tons of fish. Today, "there is only water but no fish," said Nan Sok, 60, gazing at Tonle Sap Lake from his house on the outskirts of the capital city of Phnom Penh. A Cambodian fisherman, recalls that in 1979 he could "catch the fish just by dipping my hand in the water there were so many. .But now even if I use a big net for a whole day, there would be nothing."

Cambodia's growing population which increased from 6 million in 2000 to 16 million in 20018 and changes to the lake's unusual seasonal rise and fall, are contributing to the decline in the catch. Other contributing factors include dam construction and indiscriminate, often illegal fishing practices, according to a 15-year study of Tonle Sap conducted by Ngor Peng Bun, a Fisheries Administration officer, and published in 2018. By some accounts, the lake may be reaching its capacity for fish production. Or, as Ngor Pengbun wrote in a 2018 Nature article, "Stakeholders, government and developers must put conservation and mitigation measures in place before it's too late." And now, a year later, the factors dictating changes in the Tonle Sap Lake catch, which experts say provides Cambodians with more than 70% of their protein intake, may be combining to create a crisis.

A severely low fish catch this year could cause a major food crisis in Cambodia. The country has little resources to replace the loss in fish catch with other protein sources.

Source: https://www.voacambodia.com/a/cambodia-faces-possible-food-crisis-water-but-no-fish/5141460.html

Thai seafood industry over worker rights

Thailand is the world's third-largest seafood exporter but its supplier status has been badly tainted in recent years by reports of slave labour and trafficking among the mainly migrant workforce. USA will suspend trade preferences for Thailand's seafood industry after it failed to take steps to improve worker rights, dealing a blow to the multibillion-dollar sector. All Thai seafood products will lose their eligibility for the trade preferences due to "longstanding worker rights issues in the seafood and shipping industries," Bloomberg News reported, quoting the Office of the US Trade Representative. The suspension of the trade preferences - which Bloomberg said are worth $1.3bn - will go into effect on April 25, 2020, according to a letter sent to House Speaker Nancy Pelosi.

The US suspension comes despite the European Union recently striking Thailand from its warning list in January, seeing efforts made by the government to tackle illegal fishing. Thailand had been on the list since 2015 after allegations of rampant labour rights abuses in its fishing fleets.

Source: https://www.aljazeera.com/news/2019/10/trump-hits-thai-seafood-industry-worker-rights-191026165916666.html

Major brands found failing to help Thai seafood sector tackle slavery

Efforts to protect Thai seafood workers from labour exploitation and modern slavery risk stalling as most international brands and retailers refuse to pay their suppliers more to comply with new anti-slavery policies, researchers said on Wednesday. Thai seafood suppliers are struggling with rising production costs as they seek to improve labour conditions and meet new anti-slavery laws and regulations, with little or no financial help from big buyers, found a study by rights group Praxis Labs.

The costs of protecting workers from exploitation and forced labour should be distributed equitably across the value chain," she told the Thomson Reuters Foundation. Over the last four years, Thailand has sought to clean up its multi-billion dollar fishing industry after investigations revealed widespread abuses and the European Union threatened to ban imports from the country.

New laws that tackle human trafficking and the treatment of migrant workers have been introduced to help the industry meet demand from buyers for more ethically-produced seafood. The Thai government has in recent years overhauled the legal framework governing fishing, regulated recruitment agents, updated anti-trafficking laws to cover forced labor, and implemented more stringent monitoring of fisheries.

Source: https://www.reuters.com/article/us-thailand-seafood-slavery/major-brands-found-failing-to-help-thai-seafood-sector-tackle-slavery-idUSKBN1Y804J

US$64 Billion Pledged to Protect Oceans

The sixth Our Ocean Conference 2019 on the theme "the state of the sea and measures to ensure healthy, clean and productive seas." hosted by the Government of Norway and attended by 500 world leaders and 100 youth representatives generated 370 pledges for a clean, healthy and productive ocean.

Among the 370 commitments, 22% of commitments (81) focus on the sustainable blue economy theme. The remaining commitments focus on climate change (76 commitments, 21%), marine pollution (76 commitments, 21%), sustainable fisheries (60 commitments, 16%), marine protected areas (MPAs, 53 commitments, 14%), marine security (20 commitments, 5%), and future Our Ocean Conferences (4 commitments, 1%). In terms of budget, 80% of funding ($ 51.1 billion) is committed to tackle climate change, followed by 16% of funding ($10.2 billion) to building a sustainable blue economy. Governments made the majority of commitments, representing 62% of commitments, or 229 commitments, and 7% of total funding. The private sector represents 16% of commitments, or 61 commitments, but these commitments totalled 79% of total funding, at $50.3 billion.

Chile, Costa Rica, Japan, the Republic of Korea, New Zealand, Panama, Taiwan, the US and Uruguay pledged to not provide subsidies to operators or fishing vessels engaged in IUU fishing.

A group of 30 companies and institutional investors signed the UN Global Compact's (UNGC) Sustainable Ocean Principles, which aim to secure a healthy and productive ocean. The Sustainable Ocean Principles build on and supplement the UNGC's Ten Principles on human rights, labour, environment and anti-corruption.

Palau will host the 2020 Our Ocean Conference. The US announced $ 300,000 to support Palau in hosting the Conference. Panama will host the 2021 Conference.

Source: https://sdg.iisd.org/news/our-ocean-conference-participants-pledge-usd-64-billion-to-protect-oceans/

Thai academics urges government workers rights move

Academics say Thailand has not been adequately protecting workers' rights – both Thai and foreign – and though there is some improvement, existing laws and regulations still limit their rights. Their comments came after the US Trade Representative (USTR) announced that President Donald Trump was suspending trade preferences worth $1.3 billion in trade preferences for Thailand under the Generalised System of Preferences (GSP) based on its failure to adequately provide internationally recognised worker rights.

The USTR said that "despite six years of engagement, Thailand has yet to take steps to provide Internationally recognised worker rights in a number of important areas identified in a 2015 petition from the American Federation of Labour and Congress of Industrial Organisations, such as providing protections for freedom of association and collective bargaining.

"For about 25 years, Thailand's labour movements have been campaigning for the ratifying of two key labour conventions, namely Freedom of Association and Protection of the Right to Organise Convention , 1948 [No 87] and Right to Organise and Collective Bargaining Convention, 1949 [No 98]," Lae added.

Tarit Sorat, vice president of the Employers' Confederation of Thai Trade and Industry, however, said businesses, especially exporters, are not very concerned about losing tax privileges under the GSP program. The European Union has completely removed tax privileges since 2015 because Thailand has now reached the upper-income status. What is of concern, he said, is the strengthening of the baht. However, he said, that since the US is a key market for Thailand, it should be very careful when it deals with the US government.

Source: https://asianews.network/2019/10/30/thai-academics-urges-government-workers-rights-move/

FAO says Asia-Pacific region must strengthen governance for sustainable aquaculture development

The Asia-Pacific region is taking important preparatory steps to strengthen the governance of aquaculture for sustainable development and future food security, the United Nations Food and Agriculture Organization (FAO) announced today.

Following four decades of advancements, aquaculture has surpassed capture fisheries to become the major source of fish for human consumption in Asia. Total production of aquaculture reached 103 million tonnes in 2017, and that fish supplied some 60 percent of food fish for human consumption. In 2017, the average per capita fish consumption in Asia reached 24 kg, contributing 23 percent of animal protein in Asian diets. Asian aquaculture is also an important source of livelihoods - over 18 million fish farmers in primary production and nearly equal numbers of job opportunities in related supporting sectors.

Moves toward greater sustainability required as demand increases

Globally, fish consumption is projected to increase by some 30 million tonnes by 2030 through sustainable growth of aquaculture. At the same time, aquaculture sector is increasingly being required to meet stringent environmental standards, biosecurity safeguards, food safety standards and others – and so improved governance of the sector is needed. Governance of Asia's aquaculture sector generally lags behind that of other sectors in the region improvement of governance is vital for sustainable growth of aquaculture.

In preparation for a regional consultation, FAO and NACA have coordinated national assessment studies on the status of aquaculture governance in eight countries and developed a draft regional synthesis. More than 40 government officials and experts from 15 countries and a number of regional and international organizations are participating in the regional consultation.

This regional consultation is just the start of FAO's new programme activities to support the sustainability and resilience of the fisheries sector in the region" said Xiangjun Yao, FAO Regional Programme Leader for Asia and the Pacific. "The outputs of this regional consultation, will provide a good strategic direction to FAO, NACA and APFIC's fisheries programme priorities."

Source: http://www.fao.org/asiapacific/news/detail-events/en/c/1245728/

CONFERENCES AND TRAINING PROGRAMS

AquaIndia

Scheduled for 31 January to 1 February 2020 at Chennai, India.

For details visit: www.aquaprofessional.org/aquaindia2020.html

AquaEx 2020

Scheduled for 6-8 February 2020 in Bhimavaram, Andhra Pradesh, India

For details visit: https://aquaexindia.com/

ClimFish 2020

International Conference on "Impact of climate change on hydrological cycle, ecosystem, fisheries and food security" is scheduled for 11-14 February 2020 in Kochi, India.

For more info visit: https://www.climfishcon.org/

Global Forum for Innovative Agriculture

The Forum is scheduled for 9-10 March 202 in Abu Dhabi, UAE.

For more information, please visit: http://innovationsinagriculture.com/about/?utm_source=E-Alert&utm_campaign=adf1e9a419-EMAIL_CAMPAIGN_2018_05_21_COPY_01&utm_medium=email&utm_term=0_0a4d9ec4ca-adf1e9a419-133804669

The Ocean Summit 2020

The Summit is scheduled for 9-10 March 2020 in Tokyo, Japan.

For details, please visit: https://www.woi.economist.com/world-ocean-summit/?utm_source=E-Alert&utm_campaign=adf1e9a419-EMAIL_CAMPAIGN_2018_05_21_COPY_01&utm_medium=email&utm_term=0_0a4d9ec4ca-adf1e9a419-133804669

International Conference on Aquaculture 2020

Scheduled for 16-17 March 2020 in Bangkok, Thailand.

For details visit: https://aemconferences.com/aqua/

For details visit: https://aquaculture.global-summit.com/

Seafood Expo 2020

Schduled for 21-23 April 2020 in Brussels, Belgium.

For information visit: https://www.seafoodexpo.com/global/?mkt_tok=eyJpIjoiWVdNd01ERXlOMlk1TVdSaSIsInQiOiJZNTMwU3JoZXJYRWI2K1Vjb3RsNkFiaHZGamMza1BRYklBcWd2R3ZwTEUxMVJrNXpqbCtwUUwza2pvRWMrXC93R2E0bCtic3NUaEdcLzN4aGZmc0FcL2FvaUQ4c2JNNmhVQ2szUjJyYjcxWXFjc1lKTnNMSmxtVFBFTldXNVBhSEdvVyJ9

13th Aquafeed Horizons International Conference for Aquafeed Professionals

Scheduled for 24 March 2020 in Bangkok, Thailand.

For details visit: https://www.was.org/eventCalendar.aspx

4th International Conference on Aquaculture & Marine Biology

Scheduled for 23-24 March 2020 in London, UK.

For details visit: https://www.was.org/eventCalendar.aspx

12th Global Summit on Aquaculture and Fisheries

Scheduled for 30-31 March 2020 in Hongkong with the theme: "*Innovative and Sustainable Aquaculture*".

For details visit: https://aquaculture.global-summit.com/

19th International Symposium on Fish Nutrition and Feeding BEXCO

Scheduled for 31 May to 5 June 200 in Busan, Republic of Korea.

For details visit: www.isfnf2020.com

Aqua UK 2020

Scheduled for 19-21 May 2020 in Aviemore, Scotland, UK

For details visit: https://aquacultureuk.com/

World Aquaculture & Fisheries Conference

Scheduled for 20-21 May 2020 in Tokyo, Japan

For details visit: https://worldaquacultureconference.com/

World Aquaculture 2020

Scheduled for 8-12 June 2020 in Singapore.

For details visit: https://www.was.org/meeting/code/WA2020

AquaVision

Scheduled for 15-17 June 2020 in Stavanger, Norway.

For more details visit: https://www.aquavision.org/

11th Symposium on Diseases in Asian Aquaculture (DAA11)

Scheduled for 23-27 August 2020 in Kuching, Sarawak, Malaysia.

Our Oceans 2020

Scheduled for 17-18 August 2020 in Palau

For details visit: https://www.ourocean2020.pw/

World Fisheries Congress 2020

Scheduled for 11-15 October 2020 in Adelaide, Australia

For details visit: https://www.ices.dk/news-and-events/symposia/Pages/wfc2020.aspx

3rd International Conference on Fisheries and Aquaculture

Scheduled for 10-11 August 2020 in Atlanta, USA with the theme: ""*A step towards a new era of Aqua science and fisheries technology*".

For details visit: https://scientificfederation.com/fisheries-aquaculture-2020/

13th World Congress on Aquaculture & Fisheries

Scheduled for 17-18 August 2020 in Tokyo, Japan with the theme: "*A step towards a new era of Aqua science and fisheries technology*".

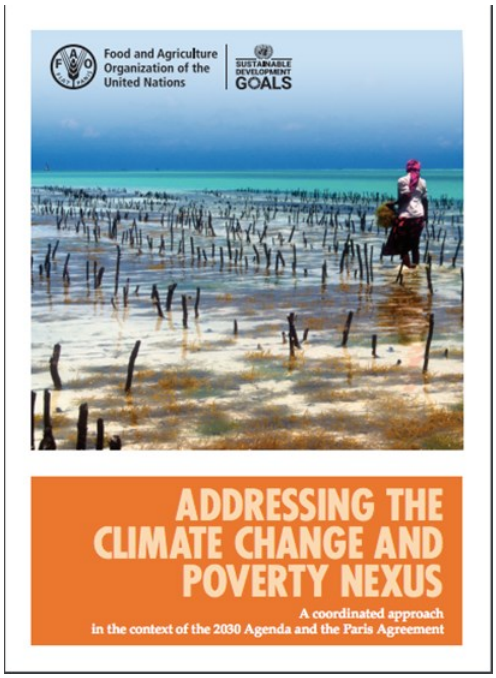
For details visit: https://aquaculture.global-summit.com/

NEW PUBLICATIONS

The State of Food Security and Nutrition

The publication can be downloaded from http://www.fao.org/3/ca5162en/ca5162en.pdf

Addressing the Climate Change and Poverty Nexus



The publication can be downloaded from: http://www.fao.org/3/ca6968en/CA6968EN.pdf

AFS MEMBERSHIP RENEWAL NOTICE

Dear AFS Members:

Thank you all AFS Members for your ongoing commitment and support towards the Society!

The Secretariat has started to update the Members details in database.

Therefore, the Secretariat requests all AFS members to update their membership dues and contact information, to the Secretariat via email at info@asianfisheriessociety.org

Kindly renew your membership dues using online payment system at http://www.asianfisheriessociety.org/join.php or you may also request the membership form from Secretariat via info@asianfisheriessociety.org.

Membership is open for all!

Please apply your membership at http://www.asianfisheriessociety.org/join.php.

If you have any question, kindly email us at info@asianfisheriessociety.org

SYNOPSIS OF PAPERS VOLUME 32 (ISSUE 3) :
ASIAN FISHERIES SCIENCE JOURNAL

Impact of Short-term Salinity and Turbidity Stress on the Early Developmental Stages of Japanese Flounder, *Paralichthys olivaceus* (Temminck and Schlegel, 1846)

TU THI CAM PHAN, ALBERT VALDISH MANUEL, NAOAKI TSUTSUI, TAKAO YOSHIMATSU
https://doi.org/10.33997/j.afs.2019.32.3.001

Coastal marine environments are exposed to frequent salinity drop and increase in turbidity due to heavy rainfall. This study evaluated the effects of short-term salinity and turbidity stress on embryonic and early larval stages of Japanese flounder. In the first experiment, embryos were exposed to different salinity and turbidity levels for a short period of 3 h. In another experiment, the salinity tolerance at different developmental stages under the turbidity level of 700 NTU was evaluated. The results showed that turbidity significantly influenced hatching rate, percentage of abnormality, total length, yolk sac volume, and survival rate, whereas salinity only affected the percentage of abnormality. Results suggested that embryos were more susceptible to turbidity compared to salinity stress, and embryos and newly hatched larvae stages were more tolerant to environmental stress conditions compared to yolk sac larvae and oil globule larvae stages.

Growth Performance and Survival of Common Carp (*Cyprinus carpio* Linnaeus, 1758) Fingerlings Fed with Protease Enzyme Supplemented Diet

DHANAJI WAMAN PATIL, JAIPRAKASH M. GAIKWAD, SANDIP SURENDRA MARKAD
https://doi.org/10.33997/j.afs.2019.32.3.002

Supplementation of feed with exogenous enzymes has been proved to improvise the growth performance. This study evaluated the effects of dietary supplementation of a protease enzyme on growth performance and survival of fingerlings of common carp. Five experimental diets supplemented with 0.0 %, 0.1 %, 0.2 %, 0.3 % and 0.4 % of protease enzyme papain were used. The study revealed that 0.2 % dietary supplementation of exogenous papain is effective for the better growth performance in terms of length gain, weight gain and specific growth rate of C. *carpio* fingerlings.

The Reduction of $CuSO_4$ Toxicity in Common Carp (*Cyprinus carpio* Linnaeus, 1758) After Pre-exposure to $CaCO_3$

AKRAM GHASEMZADEH, MASOUMEH BAHREKAZEMI
https://doi.org/10.33997/j.afs.2019.32.3.003

Appropriate usage of $CuSO_4$ as herbicide with no toxicity mainly depends on water calcium hardness. This study investigated the effect of initial exposure to $CaCO_3$ for the reduction of $CuSO_4$ toxicity in C. *carpio*. One group of fish were placed in a tank containing 200 $mg.L^{-1}$ of $CaCO_3$ for 2 weeks while another group of 300 fish was maintained at normal conditions. All 600 fish were then exposed to $CuSO_4$ at 0.0, 1.5, and 3.0 $mg.L^{-1}$ for 60 days. The highest mortality was observed in 3 $mg.L^{-1}$ of copper treatment without calcium exposure. The feed conversion ratio was elevated with an increase copper concentration. Also, the red and white blood cells, haemoglobin, and haematocrit decreased significantly at increasing copper concentration in the group that were pre-exposed to calcium. The amount of copper in muscle was elevated at increasing copper concentration but was less in the group pre-exposed to $CaCO_3$. Thus, pre-exposure to $CaCO_3$ could reduce copper toxicity, especially at low concentrations of $CuSO_4$.

Ovarian Cycle of Freshwater Pearl Mussel, *Lamellidens marginalis* (Lamarck, 1819) Collected from a Culture Pond in Bangladesh

SATHE RANI NIOGEE, KHALEDA FERDOUSH TONNI, ARUN CHANDRA BARMAN, MOHOSENA BEGUM TANU, SONIA SKU, M. JASIM UDDIN

https://doi.org/10.33997/j.afs.2019.32.3.004

The study investigated the ovarian cycle of freshwater pearl mussel, *Lamellidens marginalis* collected from a rearing pond in Bangladesh. The overall male-female sex ratio, 1:1.08 did not deviate significantly from the 1:1 ratio. Females exhibited a prolonged spawning period from February to November when water temperature remains above 22 °C. Oogenesis occurred round the year although the majority of the females were in early and late-developing stages during January and February. Four distinct peaks in maturity indices (MIs) of *L. marginalis* females were noted during October, February, June and August when most of the females were ripe and ready for spawning. Condition indices ranged from 0.42 (September 2016) to 0.85 (October 2015) exhibiting five peaks over 12-month study period.

Cost-Benefits of Grouper *Epinephelus fuscoguttatus* (Forsskål, 1775) Stock Enhancement and Sea-Ranching in Indonesia

IRFAN YULIANTO, CORNELIUS HAMMER, BUDY WIRYAWAN, HARRY W. PALM

https://doi.org/10.33997/j.afs.2019.32.3.005

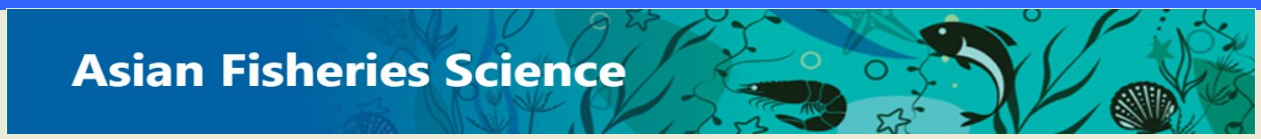
Stock enhancement and sea-ranching of groupers are a potential solution to overfishing of wild grouper catches. A simulation was conducted to estimate the cost and benefits of using brown marbled grouper *Epinephelus fuscoguttatus* for stock enhancement in the Karimunjawa Islands, Indonesia. The major costs for stock enhancement were the purchase of fish and transportation to the release site. Overall, the calculations of a theoretical benefit of 1.27–1.69 USD per released fish were estimated based on 1000 released fish of 10 and 15 cm length at release. The theoretical benefit decreased to 0.83 USD per released fish under extreme climate conditions exemplified by El Niño. Although releasing 15 cm *E. fuscoguttatus* was more costly and generated less economic benefit, the likelihood of predation for the larger fish was much lower. When the economic benefit of grouper mariculture is compared with stock enhancement, the former provides an additional advantage, which is conservatively estimated at 0.62 USD per individual. Besides, the annual benefit from the stock enhancement was estimated to be of 550,000 USD per year from related tourism activities in Karimunjawa Islands.

Short Communication:
Monitoring and Risk Assessment of Paralytic Shellfish Poisoning (PSP) Toxins in Two Estuaries at Chanthaburi Province, Thailand

TIDAPORN CHAWEEPAK, TATSUYA YURIMOTO, KAZUMI MATSUOKA, KOOLVARA SANGRUNGRUANG

https://doi.org/10.33997/j.afs.2019.32.3.006

An enzyme-linked immunosorbent assay (ELISA) kit was introduced to validate the presence of paralytic shellfish poisoning (PSP) in Chanthaburi Province, Thailand. The survey monitored the presence of PSP causative agents, palynomorph and dinoflagellates cyst from the sediment, and planktonic dinoflagellates and PSP toxins in two bivalves namely oysters, mixture of *Saccostrea* sp. and *Crassostrea* sp. and blood cockles, *Anadra granosa*. The survey did not detect toxic dinoflagellates cysts the causative agents of PSP in the two estuaries. In addition, the PSP toxin levels in the bivalves were negligible and thus safe for human consumption. Thus, the two estuaries were considered to be safe of PSP risk.



Effect of Different Dietary Lipid Levels on Spawning Performance and Egg Quality of Pangasianodon hypophthalmus (Sauvage, 1878)

MUHAMMAD ANAMUL KABIR, MOHAMMAD BODRUL MUNIR, SHARIFAH LIA FARLIANA BINTI WAN ALIAS, ADRIANA LEJA, LEE SEONG WEI, ROSHADA HASHIM

https://doi.org/10.33997/j.afs.2019.32.4.001

The effect of different levels of lipid in the diet on spawning performance and egg quality of female Pangasianodon hypophthalmus broodstock was analysed. Three test diets were formulated containing palm oil and fish oil blends with a constant protein and fed to triplicate groups of female broodstock. The ovary weight, gonadosomatic index, fecundity, egg weight and diameter and egg fertilisation rate were significantly increased for fish fed with 90 and 120 g.kg-1 lipid diet. However, there was no significant difference between fish fed with 90 and 120 g.kg-1 lipid diet. The increased performance of female broodstock fed with higher dietary lipid and fish oil at the ratio of 1:1 for crude palm oil and fish oil up to 90 g.kg-1 contributed in the enhancement of the reproductive performance and egg quality of P. hypophthalmus.

Morpho-biometric Relationship, Relative Condition Factor and Meat Yield of Distant Scallop Bractechlamys vexillum (Reeve, 1853) in Asid Gulf, Philippines

IAN CRIS RAQUINIA BUBAN, VICTOR SALCEDO SOLIMAN, RENAN UGTO BOBILES, ALEX PULVINAR CAMAYA
https://doi.org/10.33997/j.afs.2019.32.4.002

Understanding the relationships of morphometric and biometric characters of a species allows the prediction of one trait from the other and generate a measure of relative condition. These relationships were studied for the Distant scallop Bratechlamys vexillum. Representative samples collected during the dry season and wet season were used to analyse these relationships through models of simple linear and power regression analysis, revealing allometric growth patterns. For both periods, it was revealed that shell width (SW) is a slightly better predictor than the height (SH) for total weight (TW) and the adductor muscle weight (AW). The strong functional relationship was also observed between TW and AW. The relative condition factors (Kn) were high in both seasons. High meat yields were also observed in May and September. The significant difference in meat yields can be a result of the seasonal difference manifested by the dynamics of energy partitioning during gametogenesis and spawning. These biological metrics are vital inputs in analysing mariculture prospects for the resource and a contribution to the scarce information on the biology of the species.

Shrimp Yield in Relation to the Ecological Parameters of an Organic Shrimp Model in the Mekong Delta of Vietnam: A Case Study

THO NGUYEN, TU THI KIM TRAN, CHI THI HUE NGUYEN

https://doi.org/10.33997/j.afs.2019.32.4.003

This study was carried out to observe the shrimp yield and ecological parameters of the organic shrimp model certified by Naturland in Vietnam. The results showed that the ponds were shallow but the water and sediment were in general suitable for shrimp culture except in some cases when iron and oxygen levels were high. The total shrimp yield was low and the wild shrimp, cultured together with Penaeus monodon contributed significantly (55 %) to the total yield. Positive correlations between the total yield with pHH2O and pHKCl suggested that shrimp grew well in neutral or near-neutral pond bottom. Yield of wild 3 shrimp and the total yield were positively correlated with the water depth. To improve pond conditions, it is recommended that the water depth be increased to about 80–90 cm, to avoid disturbance to the mangrove soil. In addition, the water level should be higher than the forest floor, and lime (CaO) should be applied to the pond sediment that is deposited on the dikes after harvest.

Effect of Graded Levels of Aquapro® Herbal Stimulant on Growth and Intestinal Morphology in Dusky Kob, Argyrosomus japonicus (Temminck & Schlegel, 1843)

BRETT RODERICK LEWIS, MOLATELO JUNIOR MADIBANA, RASHIEDA TOEFY

https://doi.org/10.33997/j.afs.2019.32.4.004

This study was designed to test the effect of a herbal product, Aquapro® , on the growth performance and gut morphology of dusky kob, Argyrosomus japonicus. Four diets, containing Aquapro® at 0, 50, 100, and 150 g.kg-1 dry matter were formulated. A nonsignificant interaction between the diets and the fish age (weeks) on both the weight and caudal length of the fish was observed. The fish weight decreased significantly with an increase in Aquapro® inclusion in the diets beyond 100 g.kg-1 . The Aqua150 diet produced the least weight gain. Aquapro® inclusion in the diets did not cause any gut morphological alterations in the fish. In conclusion, Aquapro® product, up to 100 g.kg-1 kob diet does not negatively affect juvenile dusky kob growth and all the tested inclusion levels did not cause gut inflammation, thereby suggesting uninterrupted nutrient absorption.

Effect of Storage Temperature on the Physicochemical and Sensory Properties of Green Mussel, Perna viridis (Linnaeus, 1758)

CAMILLE ROSE TOLEDO MUEDA, SHARON NONATO NUÑAL, ROSE TOLEDO MUEDA

https://doi.org/10.33997/j.afs.2019.32.4.005

In the Philippines, the green mussel Perna viridis lacks post-harvest technologies to preserve its freshness. Wet icing is normally employed, but it often leads to deteriorating texture. The present study assessed the influence of protease activities on the texture of mussels stored in different ice:mussel ratios. Results showed that protease activities in 4 mussel increased as the storage period. Significantly highest specific protease activity was detected in samples drawn from 1:5 ice:mussel ratio while soluble protein in mussel was significantly highest from 1:4 ratio. Results also showed that measured parameters in sensory evaluation and texture profile analysis were highest in mussel samples from 1:3 and 1:4 ratio. However, mussel from 1:5 ratio obtained the highest scores for flavour and texture acceptability. Findings revealed that addition of less ice leads to higher enzyme activity and mussel flesh degradation. However, it was more acceptable in terms of texture and flavour.

Mass Culture of Daphnia magna Straus, 1820 in Fermented Medium as Feed to Enhance Nutrient Quality and Growth Performance of Nile Tilapia Oreochromis niloticus (Linnaeus, 1758) Larvae

VIVI ENDAR HERAWATI, JOHANNES HUTABARAT, PINANDOYO PINANDOYO, NURMANITA RISMANINGSIH, OCKY KARNARADJASA
https://doi.org/10.33997/j.afs.2019.32.4.006

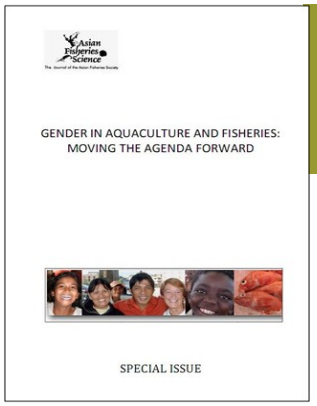
Water flea (Daphnia magna) is the best natural feed for tilapia larvae rearing. However, the quality of its nutrients and production is very dependent on the culture medium. The purpose of this study was to enhance the production and nutritional quality of tilapia fed with D. magna grown in medium that was fermented at different time intervals. Daphnia magna was mass-cultured using chicken manure as a culture medium fermented with probiotic microorganisms Lactobacillus casei and Saccharomyces cerevisiae. Tilapia larvae fed four times daily with D. magna cultured in fermentation medium for 28 days produced the best final weight, relative growth rate, biomass weight, survival rate, net protein utilisation and protein efficiency ratio. The best tilapia's nutritional quality was also seen in the same treatment that was fermented for 28 days and gave the highest value for fatty acid profile and amino acid profile. The study showed that provision of D. magna feed mass-cultured using 200 g.L-1 of chicken manure fermented for 28 days gave the best results for growth of Oreochromis niloticus larvae.

Short Communication: A Preliminary Investigation on the Population Genetic Structure of Etroplus canarensis Day, 1877 of the Western Ghats, India

JOELIN JOSEPH, SANDEEP SREEDHARAN, V.S. ANOOP, SANIL GEORGE, MANO MOHAN ANTONY
https://doi.org/10.33997/j.afs.2019.32.4.007

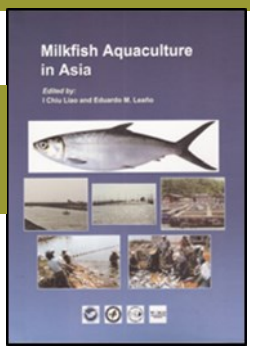
The 'Canara pearl spot', Etroplus canarensis is an endangered and endemic freshwater fish with a restricted distribution in the Western Ghats of India. In spite of the importance as an ornamental fish, no genetic and conservation studies are available for the species. In this work, mitochondrial 16S ribosomal gene sequences were used to infer the population genetic structure of three geographical populations. It is deduced from the study that all three populations in the study can be considered as a single population with a bottleneck or founder effect. Low haplotype and nucleotide diversity were observed among populations. Furthermore, data on the pairwise genetic distance (FST) and the rate of migration among populations (Nm) showed very weak genetic differentiation with low gene flow between populations. The phylogenetic tree with clustering of all haplotypes from three populations further supports the upshot of a single population. Neutrality test results provided evidence for the population bottleneck. Haplotype network analysis revealed a recent population expansion and the presence of a founder haplotype. The results provided in the study may serve as baseline data for future investigations

AFS PUBLICATION FOR SALE



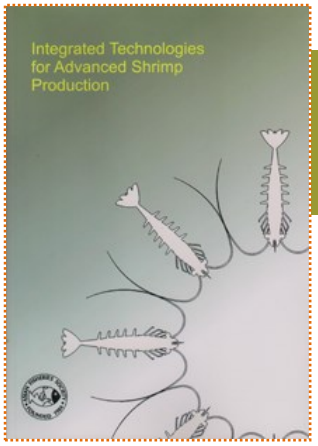
AFS Member: USD15

Gender in Aquaculture and Fisheries: Moving the Agenda Forward
MERYL J WILLIAMS, MARILYN PORTER, POH SZE CHOO, KYOKO KUSAKABE, VEIKILA VUKI,



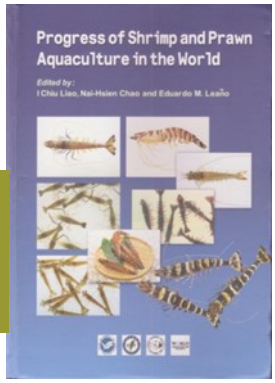
AFS Member: USD25

Milkfish Aquaculture in Asia



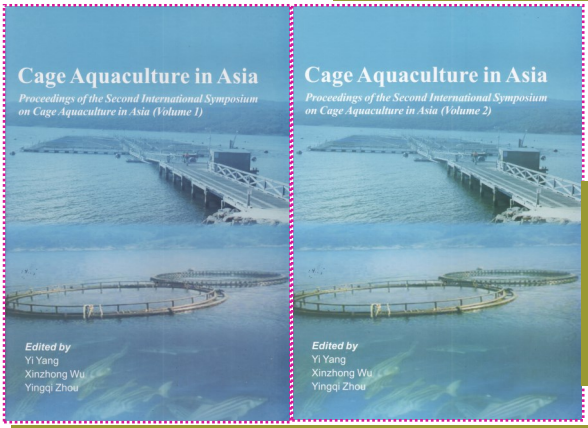
AFS Member: USD10

Integrated Technologies for Advanced Shrimp Production



AFS MEMBER: US$55

Progress Of Shrimp and Prawn Aquaculture in the world



AFS Member: USD70

Cage Aquaculture in Asia: Proceedings of the Second International Symposium on Cage Aquaculture in Asia (Volume 1 and Volume 2)

Download papers at :
http://www.asianfisheriessociety.org/publication/current.php