

# CIBANEWS



भाकृअनुप - केन्द्रीय खारा जलजीव पालन अनुसंधान संस्थान  
ICAR- CENTRAL INSTITUTE OF BRACKISHWATER AQUACULTURE  
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**BRAQCON**  
2019  
SPECIAL ISSUE

## BRAQCON 2019 SCIENTIFIC CONFERENCE





# CIBANEWS

BRAQCON 2019, Special Issue

### Published by

Dr. K.K. Vijayan  
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ICAR-CIBA - a nodal R&D agency working in brackishwater aquaculture for the past three decades with a vision of environmentally sustainable, economically viable and socially acceptable seafood production. Technology backstopping and interventions by the institute is benefiting the sector to the tune of Rs 10,000 crore annually.

**Front cover :** Inauguration of BRAQCON 2019 Scientific Conference

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#### FROM THE DIRECTOR'S DESK

The growth in the agricultural sector is less than 3% in the last 5 years while the aquaculture sector is growing at 10-14%. Fisheries and aquaculture are expected to contribute significantly to the food security and nutrition for the projected global population of 9.7 billion by 2050. Brackishwater aquaculture, particularly shrimp farming, is one of the most dynamic and fastest growing food producing sectors contributing substantially to the economy and sustainability of coastal communities worldwide. However, to sustain brackishwater aquaculture sector, a diversified farming model is most essential for long term sustainability though shrimp farming is the economic engine of Indian Aquaculture. To our familiarity, a world level conference addressing the research and development, ecosystem perspective and social relevance in brackishwater aquaculture was not held in any nation. In this context, an international conference on brackishwater aquaculture (BRAQCON-2019), a first of its kind in the world was jointly organized by the Society of Coastal Aquaculture and Fisheries, (SCAFi) and CIBA, Chennai, India, from 22 to 25 January 2019. BRAQCON 2019 was big most successful event in the fisheries sector in the context of Brackishwater Aquaculture, Coastal Ecosystem, Food Security and Societal Development.

The 'Farmers' Conclave' conducted on 22<sup>nd</sup> January, 2019 as a gateway

to the Conference was a grand success attended by about 1000 farmers from all coastal states of the country and inland states of Punjab and Haryana. About 30 innovative small-scale farmers were given opportunity to present their success stories and experiences in vernacular language on the stage along with their mentor scientists from CIBA. The 'Scientific conference' has caught the imagination of the dynamic aquaculture sector, and we have received 450 abstracts, and 31 lead talks mainly focused on species and system diversification, nutrition and feed biotechnology, brackishwater ecosystem including climate change, disease and health management, genomics and biotechnology, economics and social issues.

The lead talks were presented by national and international experts from the fisheries and aquaculture sectors. All the sessions were accommodated in the main hall itself, which enabled all the delegates to attend all the presentations, except few parallel events catered to a specific group of stakeholders. For the first time in a fisheries conference in the country, all the posters were presented electronically as "e-posters" on a digital format. Many researchers viewed this as a value-added conference, as the good quality presentations made during the Conference were published in the "Journal of Coastal Research" an International Journal with a good impact factor.

'EXPO' with 58 stalls put up by 40 national and international entities were the special attraction for all the farmers and delegates during BRAQCON, 2019. Parallel events such as 'Food Safety event' organized jointly by CIBA and the EIC of India on 23rd January, 2019 addressed the quality and safety standards for fish and fishery products and improved the awareness levels on regulatory requirements of export trade and the measures to be undertaken by various stakeholders to ensure compliance to the requirements of importing countries. 'Start Up Meet' on 24th January served as a platform for all successful entrepreneurs who achieved success after adopting new technologies developed by CIBA, spoke and shared their experiences. 'CEO Roundtable meeting' a special event with Govt. institutions, CEOs of International and National companies flagged the need for a selective breeding programme for *P. indicus*. DAHD&F along with all CEOs supported this programme on a consortium mode with all the partners representing State Govt., the Central Govt., and industry. CIBA will provide the technical expertise and R & D support for this program, and play a facilitator role.

Industry-Institutional collaboration is one of the most important prerequisites for the success and sustainability of any sector and the sector should not work compartmentally. Through BRAQCON 2019, we have succeeded in bringing

the farmers, industry players, researchers, the institutions and other stakeholders together. BRAQCON is going to be a biennial event and we intend to have the Farmers' conclave as an annual affair as we feel that they have to be updated more often.

We profoundly thank Dr. M.S. Swaminathan, the doyen of Indian agricultural research and education who had inaugurated the Farmers Conclave. We are immensely grateful to Dr. Trilochan Mohapatra, the Director General, ICAR and Dr J. K. Jena, Deputy Director General (Fisheries & Animal Science) for their support, without which this global event would not have been possible. Finally I like to acknowledge the support we have received from the government departments, institutions, private sector and corporate farming community which was a great driver of BRAQCON 2019, and I hope that this program will stimulate further research and development in the field of brackishwater aquaculture that provides better technology, products and best policy options for sustainable aquaculture. I am pleased to bring this special publication of CIBANEWS, which narrates the glimpses of all the events of BRAQCON 2019.

**Dr. K.K. Vijayan**  
Director, ICAR-CIBA



# FARMERS CONCLAVE 2019

**F**armers are the fulcrum of any farming sector around whom the technology, inputs, services and market revolve. However, farmers and their voices are not listened and generally not given opportunity to get exposed to the national as well as international community. Farmers being the backbone of the aquaculture sector their ability to access or

interact with the multitude of the support service providers are limited due to several reasons. Visualizing this, ICAR-CIBA and SCAFi Chennai has conducted the *National Brackishwater Aquafarmers' Conclave* on 22<sup>nd</sup> January, 2019 as a gateway to the World Brackishwater Aquaculture Conference (BRAQCON 2019), held during 23-25 January 2019 at ICAR-CIBA campus Chennai.



FC 2019 brought together about 1000 aqua farmers representing all the coastal states, Haryana and Punjab and, other stakeholders such as scientists, academicians, Govt. departments, industry and traders to a common platform, and discussed the burning issues in the industry. The conclave served as a platform for 'horizontal learning' among the aquafarmers who have come from all over the country to share their views, develop new partnerships and capacity enhancement among the farmers.

Unlike other scientific conventions, this was an exclusive event for the brackishwater aqua farmers and about 30 innovative small-scale farmers presented their success stories and experiences on the stage along with their mentor scientists from CIBA. This bears testimony to the

fact that CIBA has been working with the aqua farmers across the states.

### Inaugural Session

**Dr. K.K. Vijayan**, Director, CIBA welcomed the farmers, guests and other delegates.

**Prof. M. S. Swaminathan**, former Director General ICAR, world renowned agriculture scientist and Founder Chairman, MSSRF, inaugurated the farmers' conclave in the presence of

**Thiru.D.Jayakumar**, Hon'ble Minister for Fisheries, Personnel and Administrative Reforms, Govt. of Tamil Nadu, **Dr. K. Gopal**, IAS, Principal Secretary, Animal Husbandry, Dairying & Fisheries, Govt. of Tamil Nadu, **Dr. B. Meenakumari**, Chairperson, National Biodiversity Authority (NBA), **Dr. J.K. Jena**, Deputy Director General (Fisheries), Indian Council



of Agricultural Research and **Dr. N. Vasudevan**, Additional Principal Conservator of Forest, Mangrove Foundation, Govt. of Maharashtra. In his inaugural address, Professor Swaminathan suggested that when food security in India is shifting to nutritional security, fisheries sector, particularly aquaculture sector has to play an important role.

### **Session – I: Farming scenario in South East Asian Countries**

The session was chaired by Dr. B. Meenakumari, Chairman, Biodiversity Authority of India, Chennai. Dr. M. Kumaran, Principal Scientist, ICAR-CIBA and Dr. Joe Kizhakudan, Principal Scientist, MRC of CMFRI were the rapporteurs.

Dr. Weimin Miao, FAO Regional office, Bangkok made the key note presentation on 'Fisheries and Aquaculture for Food and Nutritional Security and Poverty Alleviation' highlighting the role of nutrition in fisheries and aquaculture followed by experiences in Malaysia and Myanmar. Mr. Chandra L. Ramprakash, a progressive farmer from Malaysia in his presentation, highlighted the feasibility of modern engineering technologies to provide clean water and aeration through microbubbles. Shri. Santhana Krishnan, CEO, Maritech Ltd, Chennai made a presentation on 'Enterprising Opportunities in Indian Aquaculture and Understanding of Market' in which he emphasized the existing huge demand for fish in Indian domestic markets and the scope for expansion of aquaculture.



## FARMER SPEAKERS



### Session - II: Presentation of innovative approaches and success stories by the farmers

The post lunch session comprised of presentation of innovative approaches and success stories by the farmers in their own vernacular languages along with their mentor scientists from CIBA. This session was chaired by Dr.J.K. Jena, DDG (Fy.), ICAR along with Dr. K.K. Vijayan, Director, ICAR-CIBA. The rapporteurs were Dr. Akshaya Panigrahi, Principal Scientist, CCD, ICAR-CIBA, and Dr. P.K. Patil, Principal Scientist, AAHED, ICAR-CIBA.

Dr. J.K. Jena, DDG (Fy.), ICAR summarized the deliberations and thanked the farmers for giving research community a clear roadmap and the priorities to be set for research. This wonderful event concluded with the vote of thanks by Dr. M. Kumaran, Principal Scientist, ICAR-CIBA and Organizing Secretary, Brackishwater Farmers Conclave-2019.



# BRAQCON 2019 SCIENTIFIC CONFERENCE

**T**he World Brackishwater Aquaculture conference BRAQCON 2019 was held at ICAR-Central Institute of Brackishwater Aquaculture, Chennai. **Dr. Trilochan Mohapatra**, Secretary, Department of Agricultural Research and Education and Director General, Indian Council of Agricultural Research, inaugurated the conference on 23rd January 2019. He addressed the gathering of scientist and researchers from India and abroad. In his address, Dr. Mohapatra stressed upon developing our sector sustainably, with strategically planned research and development and implement in coordination with private sectors, farmers and other stakeholders. He also spoke about the importance of genetics and genomics to improve the performance of

candidate brackishwater aquaculture species in order to have a sustainable growth and to be leaders in the field. He gave the examples of other commodities from agriculture sector and explained how genomics and gene editing has played a role in enhancing the sustainable production with increased growth, disease resistance and product quality. This inaugural session was graced by **Dr. J K Jena**, Deputy Director General (Fisheries & Animal Sciences), **Dr. J Balaji**, Joint Secretary (DAHDF), **Dr. Weimin Miao** (FAO), **Dr. S K Saxena** (Director EIC), **Dr. K K Vijayan** (Director CIBA), and world renowned leaders in the field **Dr. George Chamberlain**, **Dr. Jim Wyban** and **Dr. Robins McIntosh**.



**LEAD SPEAKERS AT BRAQCON 2019**



*Dr. Amir Neori, Israel: Integrated Multitrophic Aquaculture systems: Models for brackishwater aquaculture*



*Dr. Chris Carter, Australia: Advances in nutrition and physiology of aquaculture species*



*Dr. Iddy Karunasagar, India: Microbes of economic importance in aquaculture*



*Dr. Gustavo Pineda Mahr, Mexico: Shrimp genetics and their experience in India*



*Dr. Kallaya Sritunyalucksana, Thailand: New paradigms to solve the global aquaculture disease crisis and the role of novel diagnostic solutions*



*Dr. Lena Burri, Norway: Alternate feed resources in global aqua feed basket*



*Dr. Kazumasa Ikuta, Japan: Aquaculture and fisheries in Japan: Future directions*



*Dr. Ken Corpron, USA: Aquaculture standards and certification*



*Dr. Md. Abdus Salam, Bangladesh: Aquaponics for tropics with brackishwater species*



*Dr. Pung Pung Hwang, Taiwan: Osmoregulation in euryhaline fish and rearing in different salinity regimes with special reference to brackishwater aquaculture*



*Dr. Robin Pearl, USA: Genetic improvement programs in shrimp farming: An industrial perspective: How genetics saved my farm*



*Dr. N. Vasudevan, India: Integrating mangrove conservation and rural livelihood along with farming of crabs, oysters and cage culture of economically important fish species*



*Dr. Weimin Miao, Singapore: FAO's perspective on brackishwater aquaculture for food security, nutrition and societal development*



*Dr. Robin McIntosh, USA: Shrimp genetics are not everything*



*Dr. K K Vijayan, India: Domestication and genetic improvement of native Indian white shrimp, Penaeus indicus: a complimentary desi option to exotic Penaeus vannamei*



*Dr. Jim Wyban, Hawaii: Selective breeding of Penaeus vannamei: Impact on World Aquaculture and lessons for future*



*Dr. Trilochan Mohapatra, India: Role of fisheries and aquaculture in nutrition security of India*



*Dr. George Chamberlain, USA: Role of improved genetics and nutrition for healthy aquaculture*



*Dr. Saxena, India: Export of fish and fishery product to the world*



*Dr. S. V. Alavandi: ICAR, CIBA, Organizing Secretary, BRAQCON 2019*

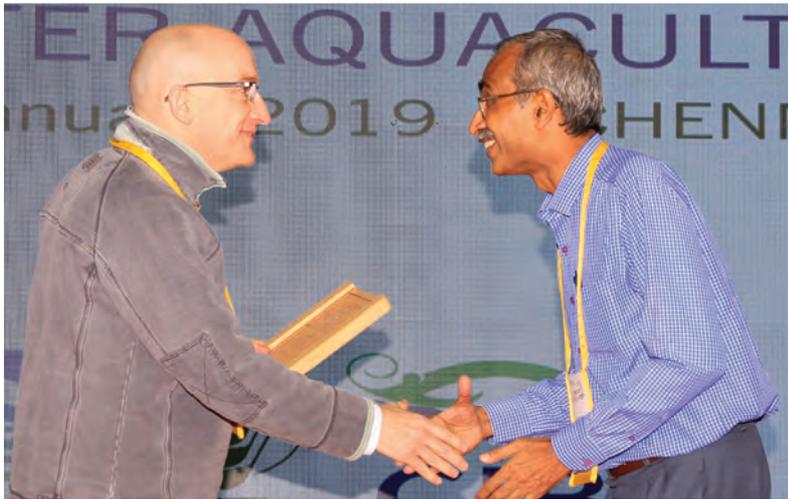


*Dr. K K Vijayan presenting the memento to Dr. Jim Wyban*



*Dr. K K Vijayan presenting the memento to Dr. J K Jena*





Dr. Chris Houton and Dr. Muraleedharan



Dr. Yugraj Singh Yadava, India: Challenges in implementing integrated coastal zone management in India



Dr. SD Tripathi and Dr. Kirsten Benkendorff

The scientific session included 34 lead talks in which 21 were international speakers. The technical sessions had themes on; Aquaculture production systems, Reproduction and larviculture, Fish and shellfish nutrition, Aquatic animal health, Aquaculture genetics and biotechnology, Aquatic environment and climate change, Brackishwater ecosystem, Brackishwater and estuarine biodiversity and conservation, Socio-economic and livelihood issues of fisheries and aquaculture. 46 oral presentations and 300 digital presentations were done under different thematic areas out of 450 abstract submissions.

Forty six oral presentations were made by researchers and students from different organizations under thematic area.

Highlights of speech by Prof. M.S. Swaminathan during the inauguration of the 'Farmers Conclave' at BRAQCON 2019



**T**here are two important challenges for Indian agriculture which our Prime Minister has been highlighting - to increase the farmers' income since it is very low and resulted in a lot of agitation. We recommended in the Farmers' Commission a pricing policy of C2+50% i.e. cost of production plus 50% more should be the procurement price. It has not been adopted so far, but has great demand among the farmers. The other major problem in our country is malnutrition, which is very high. So how do you convert food security in to nutrition security? I mentioned nutrition security as well as higher income only by the season; in both these cases, fisheries and aquaculture, both brackishwater aquaculture as well as freshwater aquaculture will have to play a much more important role because we can't allow malnutrition to go on persisting in our country. Fortunately, in this meeting we have farmers who have come together because they have actual experiences. The presence of a mixed group of farmers is a wonderful occasion for exchange of ideas. When you go to the fisheries side, these farmers experience many problems apart from the kind of cyclonic storms which come and destroy their infrastructure. In my centre here in Chennai, we have a strong programme on aquaculture - both freshwater and brackishwater. We can use them for producing more and more nutritious food and various products in fisheries. Tamil Nadu has over 1000 km of shoreline and enormous potential for brackishwater aquaculture.

Aquaculture requires considerable amount of genetic variability in terms of more efficient conversion of energy into food. There are two important groups of plants which make us much more efficient in fisheries. One is mangroves which have been neglected for long time. We made a study of the mangrove heritage or mangrove wealth of different countries of Asia. The highest concentration of mangrove was in Bhitarkanika in Odisha. We have a genetic garden near Vedaranyam of bryophytes and salt tolerant plants. We are fortunate in our country to have this enormous genetic wealth which we are preserving. So, if you want to take up brackishwater aquaculture we have to look at the materials which we have. The management of the farm is very important and above all the post-harvest management, marketing and pricing are also very important. Our fisher people are

exposed to considerable degree of uncertainty. I have seen things during the tsunami - almost all boats were destroyed and all the fishermen were in great difficulty. Since there are many problems, the insurance system should be very farmer friendly. We require urgently a proper insurance structure, proper genetic material and genetic wealth.

Well, I think we are now in a stage when I said our 'Food Security Act' of India talks about shifting from food security to nutrition security over a period of time. If you have to do that the fisheries sector will have to play an important role; particularly aquaculture. I am glad that the farmers themselves are here and they will tell you about their problems. Of course, each farmer has their own problems. The animal husbandry people have their own problem. Fortunately, in the case of dairying, we are No. 1 in the world now. We were at 10 or 15 below, now we are No. 1 thanks to late Dr. Kurian and all his colleagues. They made some important changes ensured marketing and pricing; value addition to primary milk, whole milk co-operatives and about 75 million women are involved in milk cooperatives. Similarly, I think, we need to do and take some lessons from the milk success to fisheries sector. That was the reason why they became No. 1 in the world. Why can't we also become No. 1 in brackishwater fish culture?

So, there are lot of an opportunities here, because I know, there are farmers from Gujarat who are present here; who are practicing both animal husbandry and fisheries. Fisheries sector is just opening up and we are grateful to the ICAR for starting a number of research institutions, like this one to provide scientific know-how. The scientific know-how has to be provided by the institutions like agricultural universities, animal husbandry universities, ICAR and our Boards and so on. But the scientific know-how has to be converted to field level 'do-how' by the farmers. How do you convert scientific know-how to field level 'do-how'; what are the problems which are faced, and so on. This is an industry which is based on nature and when we fight for water, we forget that 97% of water is seawater and what are we doing about it? How do you convert seawater into food and wealth and income to the farmers?

I want to congratulate Dr. Vijayan for organizing this event.





## Highlights of speech by Dr. Trilochan Mohapatra, DG, ICAR during inauguration of BRAQCON 2019, Scientific Conference

**D**r. Trilochan Mohapatra, DG, ICAR, in his address, welcomed the gathering as well as congratulated the organisers and convener for conceiving this conference. He stated the importance of brackishwater aquaculture as a vibrant sector in both the domestic and international arenas. He emphasized how there was an increase in production beyond 11MT from <1MT in 1951, with almost a 14 times increase in growth in the fishery sector in India. He mentioned that in the global scenario, China was much ahead and India a distant follower, when the volume of production was compared. Dr. Mohapatra pointed out that the growth attained by the fishery sector was remarkable, primarily because fish is an important component of our diet system, and although earlier confined to the coastal belts, it had now radiated to other parts too. He also mentioned that fish is an important component of world nutrition and malnutrition being pervasive in this part of the world, despite fish being consumed, this sector assumed greater importance. Dr. Mohapatra stated that sustainable development goals had challenges in terms of nutrition targets that had to be achieved, wherein the fishery sector had to play a bigger role than in the past. He then highlighted the significance of earning foreign exchange by export to meet requirements elsewhere and to capture markets in the global arena. He also quoted Dr. Saxena's speech where he had mentioned an export of 7 billion US dollars, 80-90% of which was contributed by brackishwater species. He thus emphasized how the conference on brackishwater aquaculture, BRAQCON, had great relevance and significance in the context of fish economy. Dr. Mohapatra discussed how the domestic demand and supply gaps thereof as well as international market forces compelled us to redesign

our strategy to export and to take advantage of the domestic and international markets. He stressed the need to discuss, deliberate, strategize and define our course of activities so that we remain relevant in the market and make it productive, remunerative to the farmers, and highly profitable to private entrepreneurs engaged in this sector. He pointed out that a 20% increase was observed as compared to the previous years and to maintain this momentum in growth was a challenge that required much effort.

Shrimp is now being cultured in the coastal and inland regions of Punjab and Haryana. He appreciated the diagnostic tools developed by the Institute and how these achievements had to be maintained with much more vigour and innovation. He implied that this kind of work had to be applied to other brackishwater species also and the need for commercialization of many more prospective candidate species. He stressed upon the need for selective breeding with regard to *P. indicus*, *P. monodon* and other species, emphasizing on selection traits such as disease resistance rather than only on size. He also discussed about different tools to be applied to take advantage of the existing species level and population level diversity and to conduct studies for the diverse sets to be utilized to get a larger population for effective selection to operate. He emphasized that we should be able to replicate and recreate our own niche like the American white shrimp, and also in the process create a market for ourselves as well as at the global level. Dr. Mohapatra concluded his speech by indicating the need for sustainable fishery in this intensive culture system for long term success, and the need for rigorous surveillance and monitoring using proper diagnostics to prevent serious damage to fish sector by trans-boundary diseases.

# WORLD BRACKISHWATER AQUACULTURE CONFERENCE





# E-POSTER SESSION

**B**RAQCON 2019 witnessed an unprecedented 450 number of submissions. In addition to the 80 oral presentations made at the conference, around 300 poster presentations were also made. A unique feature of this session was that all posters were presented electronically as “e-posters” on a digital format in place of the traditional printed posters, for the first time in a fisheries conference in the country. This allowed an opportunity for researchers to effectively convey their findings all through the conference instead of confining to specified timings.





# TEAM BRAQCON



**“Brackishwater Aquaculture for food**



**BRAQCON**  
2019

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CONFERENCE

ICAR  
CIB  
"Brackishwater aquaculture for food, employment and prosperity"



...ood, employment and prosperity"



# EXHIBITION AT BRAQCON 2019

**O**n 22nd January 2019, **Shri. Jayakumar**, the Chief Guest of the programme inaugurated the exhibition. The Exhibition at BRAQCON 2019 had around 58 stalls put up by 40 national and international entities which included feed manufacturers, farm input manufacturers and suppliers, producers and suppliers of diagnostic kits, publishers, broodstock suppliers, hatcheries, financial institutions, Universities and Govt. Institutions. Another 5 stalls were put up by Ornamental Fish breeders and suppliers, and one each by the TNFDC and a Thanjavur based Organic Point, a manufacturer and supplier of organic foods.







## QUALITY AND SAFETY STANDARDS FOR FISH AND FISHERY PRODUCTS: AN INTERNATIONAL PERSPECTIVE

**C**IBA and the Export Inspection Council (EIC) of India, the nodal export certification body under Ministry of Commerce & Industry, jointly organized this as special parallel event on 23<sup>rd</sup> January with an objective to improve the awareness levels on regulatory requirements of export trade and the measures undertaken by various stakeholders to ensure compliance to the requirements of importing countries. Dr Saxena, Director EIC

and Dr K KVijayan, Director CIBA coordinated the event. The event created a common platform for all the stakeholders involved in the supply chain, such as hatchery operators, farmers, feed and healthcare products manufacturers, processors, traders, exporters, regulating & promoting bodies, educational & research institutions to interact among themselves as well as with the representatives from the major importing countries like, US, EU and Australia.





In the session: Identifying the role of primary production in ensuring the safe food for both domestic and international consumers, participants voiced on the importance of collaboration between institutions like EIC, MPEDA, CAA, CIFT and CIBA for the betterment of the sector and holistic development to achieve the economic gains. More than 150 professionals from different seafood export houses across India and the faculty of food processing and senior officials from Tamil Nadu Fisheries University participated in the program. In the technical session, experts from EIA, CIFT, CIBA, CAA, MPEDA and the Department of Fisheries, Andhra Pradesh presented the role played by respective institutions in ensuring

the safety of seafood produced in India in the entire value chain. Representatives from major importing countries like EU, Canada and Australia lauded the efforts taken by the country for the safety of seafood production and expected stringent regulatory measures in place to meet the higher levels of compliance currently required.

This technical session was chaired by Dr. S.K. Saxena, Director (I&Q/C), Export Inspection Council of India, and Dr. C.N. Ravishankar, Director, Central Institute of Fisheries Technology (CIFT). Dr. P.K. Patil, Principal Scientist, ICAR-CIBA, coordinated the session and Dr. S.K. Panda, Principal Scientist, ICAR-CIFT moderated the proceedings.



# CEO ROUND TABLE

**A**s part of BRAQCON 2019, a special round table meeting of the CEOs from major aquaculture and allied companies was organized at ICAR-CIBA, Chennai on 24th January, 2019. Twenty CEOs from Indian and foreign companies engaged in aquaculture and allied activities participated in the discussions. The programme was co-ordinated by Mr. S. Santhana Krishnan, CEO, Maritech Ltd, Chennai, and Mr. Ashok Nanjappa from BMR Group.

Dr. K.K. Vijayan, Director CIBA highlighted the themes for discussion, that included genetic improvement programme for the Indian white shrimp, *Penaeus indicus*, up-scaling Seabass aquaculture in India, and saline Tilapia Farming. He stressed that diversification of aquaculture with regard to species and culture systems was extremely important. India has just been utilizing about 15% of the brackishwater resources and there is ample scope for diversification. He

outlined the advantages of indigenous white shrimp, *P. indicus* in breeding and culture and pointed out that the performance of the Indian white shrimp matched that of the exotic SPF Pacific white shrimp, *P. vannamei* in terms of growth upto 18-20 g absolute body weight. He mentioned that the three tier system in seabass aquaculture, the larval rearing, nursery rearing and grow-out culture proposed by CIBA was well received to enable farmers to get faster returns by reducing culture duration in the grow-out ponds. He suggested that ICAR-CIBA would take up the role of scientific support and policy facilitation.

The CEO forum strongly agreed on the need for developing a SPF programme for an additional shrimp species for diversification. Dr. J. Balaji, IAS, Joint Secretary (Fisheries), DAHD&F, Government of India highlighted the current status of aquaculture sector and expressed concern on the negative effects



of sole dependence on vannamei species. He mentioned that diversification of cultured species is important and government is willing to provide an enabling regulatory framework and fund was never a problem and asked to submit a proposal with strong scientific basis and practical business relevance by any stakeholder group. He remembered the contribution of DAHD&F along with ICAR-CIBA and other Institutions in taking the bold decision of introduction of exotic vannamei shrimp in the year 2009. He suggested that India should have SPF programmes for indigenous white shrimp and also black tiger shrimp, along with candidate fish species like Asian Seabass, Cobia and Tilapia.

Dr. Saxena, Director, Export Inspection Council (EIC), while supporting diversification of species in Indian Aquaculture, highlighted EIC's concern

on responsible aquaculture and food safety, complying with International market standards since the importing countries have been stringent on quality compliance. Mr. Carlos Pineda, CEO, Blue Genetics, Mexico, agreed that *P. indicus* is suitable species for India and requires long term investment, local partner in the country for production and marketing control, the economic parameters and the time frame of SPF programme for gaining the confidence of multi-national companies. Mr. B.Masthan Rao, CEO, BMR Group, narrated the story of vannamei introduction and the struggles undergone from 2002 to 2009 in vannamei introduction, pointed out the less feed cost for Indian white shrimp than vannamei and offered all possible help for the SPF development programme of Indian white shrimp.



Dr. Robins McIntosh, Executive Vice President, CP Foods, Thailand, highlighted the points on Chinese failure of SPF vannamei stock and the quality of Hawaii stock and meat yield of *P. monodon* of about 70-80 percent which makes monodon as a preferred shrimp by consumers. Dr. P. Ravichandran, former Member-Secretary, CAA, supported the initiative of the SPF programme of Indian white shrimp, and highlighted the need for multi-locational Nuclear Breeding Centres (NBCs) and Broodstock Multiplication Centres (BMCs) for supply of *P. indicus* to Indian aquaculture farmers. Mr. Rahul Kulkarni of West Coast Group, Mumbai, Mr. Ramakant Akula, CEO, Waterbase Limited, representative from CLAFMA and Dr. P. Selvaraj, General Manager, NABARD supported the idea of developing SPF of Indian white shrimp, and assured their support.

Mr. Sanjeev Saxena, Additional Director General, Intellectual Property Management and Technology (IPTM), ICAR, mentioned that CEO's

must now initiate steps to crystallize the idea of making a business plan for these projects along with the funding agencies / Ministry and others concerned.





# START-UP MEET 2019

**A**s a part of the conference, a Start-Up Meet was organized on 24<sup>th</sup> January 2019, chaired by Dr Sanjeev Saxena, ADG, IPTM, ICAR, New Delhi, in which about 70 participants including scientists, business entrepreneurs, Start-Up entrepreneurs, prospective Start-Up personnel, Senior officials from NABARD, Patent Office, State Department officials from Tamil Nadu, Andhra Pradesh and Odisha,

Oriental Insurance, faculty students from fisheries college have participated in the group-discussion meet on opportunities, problems and prospects of the Start-Ups in aquaculture sector. Dr Saxena in his address explained in detail, the opportunities, problems and support systems of the Start-Ups and asked to focus not only on success stories, but also on failures so that future start-ups would learn lessons from them.





Dr. Jayanth Murali, I.P.S., Director, Department of Vigilance and Anti-Corruption Wing, Government of Tamil Nadu in his chief guest address focused on use of ICT in Start-Ups and gave a mentor talk. Senior officials from NABARD, patent office, MSME, DoF from Tamil Nadu, Andhra Pradesh and Odisha, Oriental insurance and Ernst and young consultants explained the schemes and funding pattern for start-ups. The existing and prospective start-ups briefly shared their experiences and expectations. The students from

Fisheries Colleges proposed their start-up projects and the same were appreciated and appropriate suggestions were given to them.

The meeting concluded with the main idea that start-up personnel need to be confident on the enterprise they are going to start, need to concentrate deeply on the probable consequences in all degrees and work hard to achieve the same in which they need to create a networking of eminent personnel for sustaining their position as a successful entrepreneur.



## BRAQCON 2019 RECOMMENDS SPECIES DIVERSIFICATION AND A SEPARATE MINISTRY OF FISHERIES IN THE INDIAN GOVERNMENT

**T**he World conference on Brackishwater Aquaculture BRAQCON 2019 was held during Jan 22 – Jan 25, 2019 in Chennai as a first of its kind International Conference in global brackishwater aquaculture sector. The conference discussed and deliberated major issues in brackishwater aquaculture on diversification, nutrition, genomics and biotechnology, health management, environmental and social issues. After four days of intense deliberations, including the ‘Farmers’ Conclave’ on 22nd January 2019, BRAQCON 2019 strongly recommended the following aspects for the Indian brackishwater aquaculture sector to enhance production on a

sustainable basis and socially acceptable while being economically viable.

■ Current scenario of Indian brackishwater aquaculture and even the global brackishwater aquaculture is dominated by a single exotic shrimp species. Considering the over dependence of the sector on a single species, diversification is recognised as the need of the hour. Unless India diversifies its brackishwater aquaculture sector with more species, the sector would be always vulnerable, which is often governed by external market trends. Techno-economically viable potential species such as Indian white shrimp and seabass have to be added to the Indian aqua farming basket.



■ Diversification of farming systems for sustainable aquaculture, such as open water low volume cage culture, integrated multi-trophic aquaculture (IMTA), polyculture should be given priority.

■ The major challenge in expanding the brackishwater aquaculture is availability of stockable size seeds of required quantity and quality. Seed production technology of all the potential species needs to be developed.

■ Selective breeding program for native white shrimp, *Penaeus indicus* and potential finfish species have to be implemented as national priorities. The CEO round table meet during BRAQCON 2019 strongly agreed on the need for developing a SPF programme for an additional shrimp species for diversification in India.

■ Cost effective indigenous feed has to be developed for all the life stages of the potential candidate species in brackishwater. Functional feeds and speciality feeds customized for different aquaculture systems need to be developed.

■ To resolve the issue related to fish meal trap, inclusion of non-conventional ingredients such as single cell protein, insect protein, corn protein concentrate, supplementation of amino acids and exogenous enzymes needs to be explored.

■ Awareness of health benefits of brackishwater species should be created among public. Designer feeds may be introduced to alter the final product composition of farmed species considering the human health and hidden hunger.

■ Technologies need to be developed for prevention and control of important diseases of candidate species. Mobile aqua-clinics, field level water quality and diagnostic kits, need to be introduced. Biosecurity and better management practices have to be updated periodically and awareness has to be created among aqua-farmers on a regular basis.

■ Marketing channels of farmed shell fish and fin fishes have to be strengthened, especially with regard to the domestic markets.

■ Food safety needs to be addressed at all stages of value chain from primary production to processing. Stringent regulatory measures have to be implemented to meet the higher levels of compliance in complete chain of seafood production in the country.

■ Awareness campaigns should be conducted on the coastal zone management for various stakeholders of the sector.

■ Policies need to be put in place on the access and ownership of open brackishwater resources.

■ Brackishwater ornamental fishes need to be promoted under the national ornamental fish portfolio.

■ Social benefits through aquaculture have to be highlighted along with the economic benefits.

■ Customized family farming models have to be developed and demonstrated across the coastal states of the country to suit the region specific social, environmental and economic status of the farmers.

■ Customized farming models involving different species composition needs to be developed to conserve the highly fragile estuarine and mangrove ecosystems.

■ Awareness on the sustainable ecosystem and biodiversity needs to be considered during developmental plans in brackishwater ecosystem.

■ Effect of climate change on aquaculture and their remedial measures are to be publicized among the stakeholders and environment friendly better management practices to be developed considering the climate change scenarios.

With regard to the issues raised and the recommendations of the BRAQCON 2019, it is necessary to identify the right institutions to take it forward for implementing the recommendations. The problems of aquaculture were of international in nature and cannot be solved by a single country alone and that it is necessary that all concerned countries should work together to solve issues in aquaculture. Hence collaborative research would be necessary in achieving the objectives. **Dr. Modadugu Vijay Gupta**, the World Food Prize Laureate, asserted that, with a value of coastal and marine resources worth 28 trillion USD, the fisheries sector contributes significantly towards the livelihood for coastal communities. He mentioned, in India alone, 15 million people were directly involved in fisheries activities and many more millions were involved in other ancillary activities related to fisheries and aquaculture. Compared to the poultry and livestock industry, the fisheries sector had the lowest carbon footprint. Considering the significant contribution by fisheries and aquaculture to the food security of the growing populations, he stressed the importance to create a separate Fisheries Ministry in Govt. of India, which had been promised in 2006 itself by the cabinet minister to agriculture at that time, while inaugurating the National Fisheries Development Board.



# VALEDICTORY SESSION

**V**aledictory session was presided over by World Food Prize Laureate, **Dr. M. V. Gupta**. In his address, Dr. Gupta congratulated CIBA and SCAFi for organizing the World Conference on Brackishwater Aquaculture at appropriate time and stressed on the need for the creation of a separate Ministry for Fisheries in Govt. of India. His major concern was on the exclusive dependence of brackishwater aquaculture sector in India on one single species, *Penaeus vannamei*. He highlighted that the country had several potential species that could be used for enhancing production & productivity of the aquaculture sector and suggested that CIBA identify the right institutions to take the conference recommendations further forward to be able to implement them.

**Dr. S.D. Tripathi**, former Director, CIFA & CIFE, presented the list of recommendations of BRAQCON 2019. One of the key recommendations of the conference was on the need for species diversification as a national priority in brackishwater aquaculture,

considering the present domination of the sector with a single exotic species. **Prof. Chris Hauton**, University of South Hampton, UK congratulated CIBA and SCAFi for successfully organizing BRAQCON 2019 and expressed his satisfaction on the quality of presentations from successful fish farmers and scientists. He suggested that it is necessary for all concerned countries to work together to solve issues pertaining to aquaculture with regard to diversification, diseases, seed quality, etc. **Dr. K. K. Vijayan**, in his valedictory address thanked the stakeholders of the sector for the overwhelming response and support in making the first ever unique World Brackishwater Aquaculture Conference a great success. He assured that the recommendations of the conference would be taken to the highest level in the Govt. and press for its implementation. He also announced that the farmers' conclave would be held every year at different aquaculture hubs in the country while BRAQCON would be a biennial event, held as a flagship programme of Indian brackishwater aquaculture sector jointly with all other stakeholders of the sector.





**Self-help group –Cheque distribution**



*Distribution of cheques by chief guests to the SHGs of Sindhudurg towards the sale of seabass fingerlings produced in compact open water nursery cages with the technology and input support from ICAR-CIBA, Chennai*



# TECHNOLOGIES & PRODUCTS

## 1. Multiparameter Water Analysis Kit

Dissolved oxygen, ammonia, nitrite, calcium & magnesium minerals, total hardness, carbonate, bicarbonate and total alkalinity

- Cost effective and handy
- Single kit for use in freshwater, Brackishwater & coastal waters
- Can be used in hatcheries & grow-out farms
- Commercialized to New Bio Science Co, Mysore during Start-up Meet of this Conference



- Formulated with locally available ingredients
- Sustainable
- Cost effective
- Enriched with EPA and DHA Immune boosters



## 2. Plankton<sup>Plus</sup>

A quality cost effective desi product for aquaculture from fish trimmings under the concept “waste to wealth”

- Useful in both shrimp and fish farms
- Increases desired plankton population growth
- Increases survival by 8-10 %
- Increases immunity
- Increases productivity by 1.7 ton/ha
- Reduces formulated feed by 10-30%
- Cost Rs. 2,500/- per hectare



## 4. EHP Real time PCR kit

- EHP is an important disease of shrimp
- Cause significant economic loss

This kit is

- sensitive detects upto 2 copies
- cost effective
- user friendly
- get result in 90 min



## 5. LUMI Phage

Anti- vibrio bacteriophage

- Vibriosis cause 100% mortality of shrimp larvae
- Is a natural killer of luminescent vibrio bacteria
- Works as prophylactic and therapeutic
- Compatible to use along with probiotics



## 3. Seebass<sup>Plus</sup>

Cost effective indigenous feed for farming of Asian seabass

- Balanced feed for seabass, *Lates calcarifer* larvae, juveniles and adult stages

## 6. WSSV Real-time PCR Kit

- WSSV cause 90% to 100% mortality within 3-10 days
- No treatment for WSSV
- Prevention of virus entry only means to manage

This kit is

- cost effective
- user friendly
- highly sensitive to detect upto 2 copies of viruses
- Result obtained in 90 min





# SMART APPS



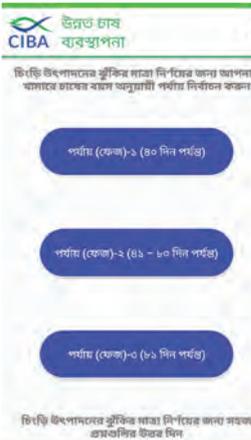
**Chingri - চিংড়ি - বিজ্ঞান সম্মত চাষের খুঁটিনাটি**  
 ICAR CIBA Health & Fitness  
 ★★★★★ 5  
 This app is compatible with all of your devices.  
 Install



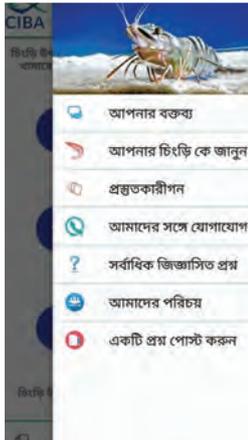
**CIBA Shrimpapp**  
 ICAR-CIBA Books & Reference  
 ★★★★★ 178  
 This app is compatible with all of your devices.  
 Installed



উন্নত চাষ ব্যবস্থাপনা  
 উপযুক্ত স্থান  
 পুকুর নির্মাণ  
 জৈব নিরাপত্তা  
 পুকুর রক্ষণ  
 জল প্রস্তুতি ও সার প্রয়োগ  
 মিন নির্বাচন এবং মজুদকরণ



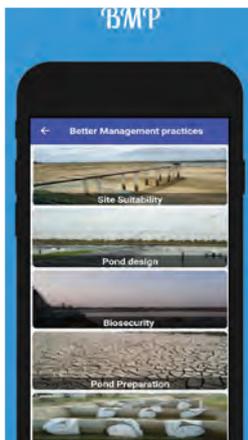
উন্নত চাষ ব্যবস্থাপনা  
 চিংড়ি উৎপাদনের সুস্থিত পাত্রা নি-বিহীন জলর আদর্শ স্থানে রাখা বর্ষা অসুস্থ্য পর্যায়ে নির্বাচন করুন  
 পর্যায় (ফেজ)-১ (৪০ দিন পর্যন্ত)  
 পর্যায় (ফেজ)-২ (৪১ - ৮০ দিন পর্যন্ত)  
 পর্যায় (ফেজ)-৩ (৮১ দিন পর্যন্ত)  
 চিংড়ি উৎপাদনের সুস্থিত পাত্রা নি-বিহীন জলর আদর্শ স্থানে রাখা বর্ষা অসুস্থ্য পর্যায়ে নির্বাচন করুন



আপনার বক্তব্য  
 আপনার চিংড়ি কে জানুন  
 প্রস্তুতকারীগন  
 আমাদের সঙ্গে যোগাযোগ  
 সর্বাধিক জিজ্ঞাসিত প্রশ্ন  
 আমাদের পরিচয়  
 একটি প্রশ্ন পোস্ট করুন



Input Calculators  
 Pond area & volume  
 Disinfection  
 Lining  
 Biomass  
 Feeding Rationing  
 Feeding Management  
 Rationing  
 Mineral



BMP  
 Better Management practices  
 Site Suitability  
 Pond design  
 Biosecurity  
 Pond Preparation  
 Water treatment and fertilization



Dashboard  
 Vanamli Shrimpapp  
 Better Management practices  
 Input calculators  
 Disease Diagnosis  
 Risk Assessment  
 FAQ's

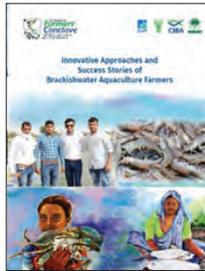


**CarryCap**  
 Carrying Capacity Estimation of Waterbodies  
 This tool estimates the Carrying Capacity (CC) of source water for brackishwater aquaculture. CC refers to the maximum development of aquaculture farming that a waterbody can accommodate without excessive water quality degradation. The CC of a waterbody can be defined in terms of nutrient loading as the level of nutrients, which can be assimilated by the waterbody without exceeding the permissible levels. It essentially depends on the hydrological conditions such as tidal aptitude, tidal current and ecological conditions. The aquaculture area that can be operated sustainably on source water will be quantified and its estimation requires data collection of various parameters for use in carrying capacity estimation for one year or atleast for one crop and more refined modeling. This tool will be of immense use to brackishwater farming sector and government agencies dealing with land use planning, aqua zoning and environmental regulation.  
 Click me to Start  
 For Queries/Suggestions Pl. Contact  
 Dr. M. Muralidhar  
 For further details  
 Dr. K.K. Vignyan, Director  
 ICAR-Central Institute of Brackishwater Aquaculture  
 75, Seashore High Road, MRC Nagar,  
 Chennai - 600 028  
 TN, India

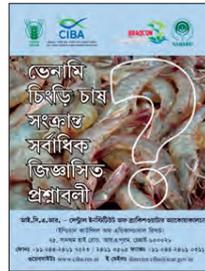


# BOOKS

**1. Innovative approaches and success stories of brackishwater aquaculture farmers**



**2. FAQs on Penaeus vannamei in regional languages (Tamil and Bengali)**



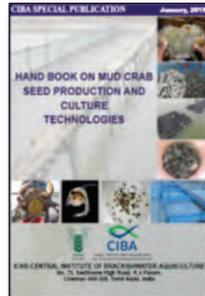
**3. Fostering Aquaculture Start-Ups 2019**



**4. A Guide to Milkfish (Chanos chanos) Aquaculture**



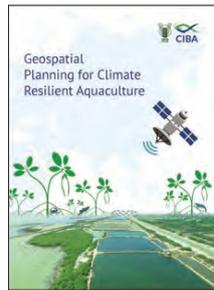
**5. Handbook on mud crab seed production and culture technologies**



**6. Reproductive and production potential of Indian white shrimp across different coastal states of India**



**7. Geospatial Planning for climate resilient aquaculture**



**8. BRAQCON 2019 Souvenir Book**



**9. BRAQCON 2019 Abstract Book**



**10. AQUASTAT India 2018**



**11. Family farming model in brackishwater aquaculture for livelihood support of communities living around Adyar Creek**





## Glimpses of BRAQCON 2019



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