

Engaging Stakeholders in the Aquaculture Business Incubation Space

– Expeditions of ICAR-CIBA from 2002–20

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Brackishwater aquaculture has been a dependable subsector of fisheries for food, employment, and prosperity through export earnings since the 1980s. The export of shrimps has superseded the export of all agricultural commodities, taken individually, in 2018-19. From \$1.91 billion (₹ 8,607.94 crore) in 2008-09, India's marine exports increased to \$7.08 billion (₹ 45,106.89 crore) in 2017-18 which includes \$4.85 billion (₹ 30,868.17 crore) from frozen shrimps. About 90 per cent of shrimp exports are today from Pacific White Shrimp. In a decade, shrimp production had gone up more than nine times to roughly 7 lakh tonnes, of which the share of Penaeus vannamei was 6,23,000 tonnes. Ensuring the supply of quality seeds, feed, and other farm inputs is the key to the continued success of the sector.

Key words: Aquaculture, Brackishwater, Business Incubation, Shrimp farming

ICAR STARTED technology development efforts in brackishwater aquaculture in 1973 with an All India Coordinated Research Programme on Brackishwater fishes. The encouraging research results which were keenly taken up by farmers summited into the birth of ICAR-Central Institute of Brackishwater Aquaculture in 1987. Since then, the institute has put in concerted efforts in the sustainable development of the brackishwater aquaculture sector.

Timeline of technology development

The growth in aquaculture in India has been facilitated by putting in place better management of cultural practices, ensuring supply of good quality seeds and providing feed at relatively cheaper rates and supporting aquaculture activities with disease diagnostics, and analytical kits, immune stimulants, and bio-remediation process, identifying new and emerging as markets, exploring

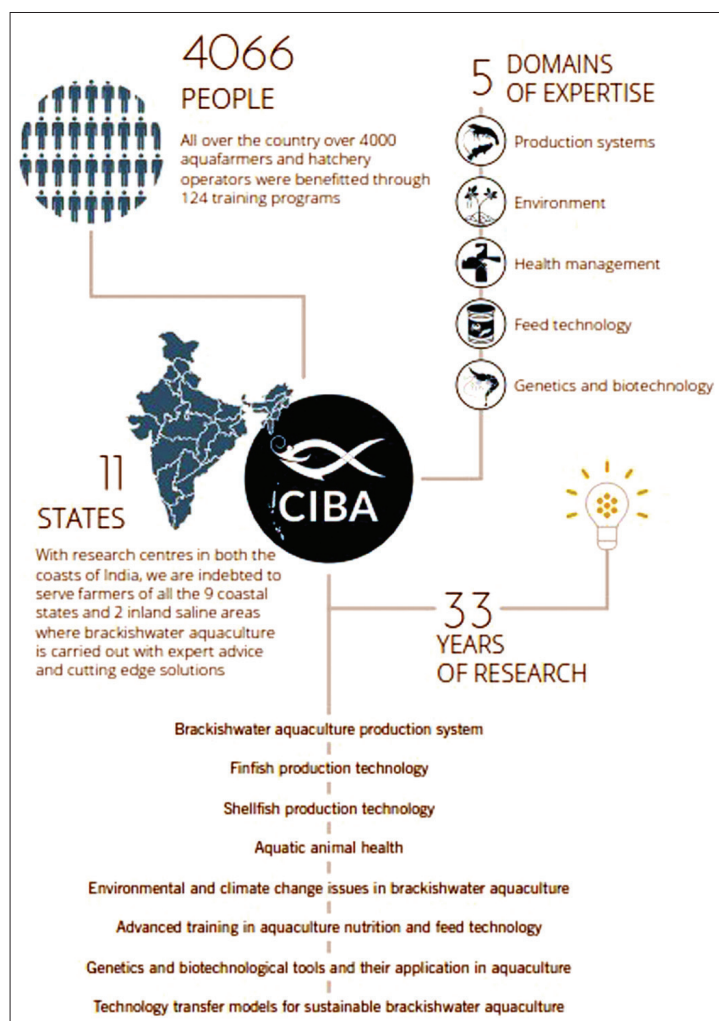
international as well domestic marketing practices have also benefitted Indian Aquaculture.

Seeds: Like in any agricultural enterprise, the quality of seed is a crucial issue in Aquaculture also. In Aquaculture, quality of seeds not only helps in the condition of shrimp larvae but also screening of disease, due to which shrimp seeds are dependent on disease-free status. The seeds produced by hatcheries since the 1990s have helped the sector to grow from 40,000 - 50,000 tonnes to more than one lakh tonnes till the 1990s.

Feed: Feed is the most critical and expensive component in the cost of production of the system of Aquaculture. ICAR-CIBA developed technology for low-cost indigenous feeds, which is being marketed as Vannamei plus by at least seven feed mills across India with the cost of ₹ 55-65. This intervention has helped the farmer to get a reasonably good

quality feed at a cheaper cost with feed performance comparable to leading commercial brands. Of late commercial brands have also introduced cheaper products in the feed market lines. CIBA feed technology helped farmers to reduce the input costs by 0.75 to 2.25 lakhs per hectare, increasing the farmers' income.

Inputs: Aquaculture input, including probiotics, immune stimulants, are essential requirements for necessary shrimp farming. Further, the availability of diagnostic foods for effective management of disease and environmental quality is essential. The Institute has developed many products for the benefit of farmers of the Aquaculture sector including a diagnostic kit for WSSV, soil, and water analytical kits for P, K, Mg, Na, and pH level, the Institute has also produced a successful immune stimulant marketed as IMMSTIM. Another bio-remediation product named CIBASTIM also has



In order to encourage technologist and scientists to turn their innovative agri-business ideas to sound commercial ventures ICAR-CIBA established **Agri-Business Incubation Centre**. These centre helps prospective entrepreneurs, by providing pro-active and value-added business support in terms of technical consultancy, infrastructure facility, experts' guidance and training to develop technology based business ideas and establish sustainable enterprises.

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25 small and medium-sized technologies and technology-enabled enterprises and has helped to create good number of jobs.

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There are 40 registered incubatees at ABI, from all over India and it possess good infrastructure facilities.

09

9 entrepreneurs in a corporate environment within the premises of Institute catering to diverse fields in fisheries sector have already graduated from ABI.

07

Organized 7 entrepreneurship Development programmes across India

09

Organised 9 sensitization programmes for students

Success stories of ABI-CIBA entrepreneurs

Low input based farming of milkfish and its popularization as Deccan Hilsa in Sundarban – an innovative approach
—Amalesh Chatterjee



Mr. Amalesh Chatterjee, an engineer by profession, is a progressive aqua entrepreneur from Khamargachhi, Hooghly, West Bengal. He in association with ICAR-CIBA developed and demonstrated the low input based farming of milkfish and its popularization as Deccan Hilsa in Sundarban region of West Bengal.

Pond based aqua-agri integration for the socio-economic transformation of farm families in the Sundarban region of West Bengal
—Debakinandan Patra



Mr. Debkinandan Patra is a marginal farmer of Madanganj village, Namkhana block of the Sundarban. He has pioneered the aqua-agri integrated model developed by Kakdwip Research Centre of CIBA for the livelihood security of coastal families of Sundarban region of West Bengal.

Biofloc based shrimp nursery rearing the means for sustainable shrimp farming – a success story
—Aditya Pradhan



Shri Aditya Pradhan an innovative aquafarmer from Balasore district of Odisha has about 30 years of experience in brackishwater aquaculture. He established an eco-friendly biofloc based nursery rearing for Pacific white shrimp *P. vannamei* with the support of ICAR-CIBA and popularising this on-farm nursery model in Odisha.

been successfully commercialized. The above mentioned scientifically developed and tested/validated products have helped the sector to grow sustainably. The inputs also ensure increased production at a reasonable expense in the sector.

ICAR-CIBA has been engaged in business incubation for the last six years with a grant of Business Planning and Development Unit sanctioned by the National Agricultural Innovation Project (NAIP-ICAR) funded by the World Bank in 2013. The Institute conducted three Business meets in Chennai, Kolkata, and Navsari, Gujarat, during 2013-14. ICAR-CIBA has successfully formalized 104 arrangements of technology upscaling with individuals, corporates, and other institutions in the form of MoUs/MoAs.

Thirty incubatees graduated from ABI, ICAR-CIBA, and seven incubatees being handheld at CIBA in onsite and offsite modes, currently.

ABI, ICAR-CIBA, has generated ₹ 1.86 crores as revenue from business incubation and technology commercialization activities since 2013.

The Institute has entered into 120 MoUs/MoAs with individuals/firms and Institutions. Three types of MoUs have been entered with external entities. Firstly, MoUs made with other research entities like IITs, Universities, and Research

Institutes like CIBA, secondly MoUs with corporate bodies and thirdly directly with farmers/entrepreneurs. The Institute Technology Management Committee (ITMC) scrutinizes new proposals and modifications/amendments required in existing PPP arrangements. ITMC discusses and collectively takes decisions and recommends to In-charge ABI/Director for execution. For scientific brackishwater aquaculture development in the country ICAR-Central Institute of Brackishwater Aquaculture is the nodal research and development center. The brackishwater aquaculture generates about ₹ 30,000 crores of foreign exchange and is a very vibrant commercial activity. Demand by the sector for the supply of quality seed, feed, chemical/biological products, diagnostic, and analytical kits is

tremendous. Hence, entrepreneurs - startups to large corporates regularly approach CIBA for technological support.

The ICAR- CIBA technologies and services are of five major categories:

1. Process development like the development of fish breeding protocols and practices
2. Formulation of new feed and improvements in indigenous feed technology
3. Product development automatic feeders, solar-powered equipment
4. Capacity building and training and
5. Technical services like disease diagnosis, soil and water testing, consultancy services.

The institute serves multiple stakeholders and needs of the aquaculture sector, but the effective

interface between the Institute and individuals/firms and other entities in the form of the Agri-Business Incubation center is very much essential for promoting partnerships with entrepreneurs/start-ups.

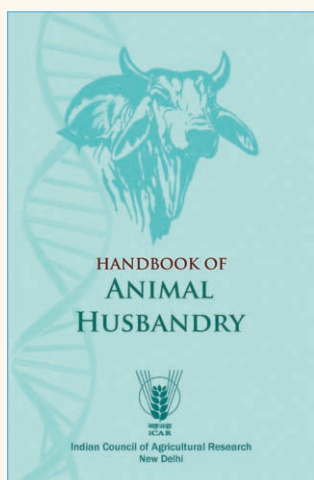
Specific activities are:

- A. Strengthening the process of commercialization of technology
- B. Handholding small and medium enterprise to develop business
- C. Skill upgradation
- D. Development of bankable projects for entrepreneurs
- E. Consultancy services to the industry, and NGOs
- F. One-stop-center for technology exposure to the entrepreneurs, industry

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HANDBOOK OF ANIMAL HUSBANDRY

Livestock sector has created a significant impact on equity in terms of employment and poverty alleviation. After staple crops, livestock sector is the second most important contributor to the agricultural economy. The



producer prices of meat, eggs and milk, in India appear to be highly competitive as the domestic producer prices of these products are quite low compared to the ex-farm gate prices of major exporters in the world markets. A knowledge resource is essential to harness the potential of animal production. The Indian Council of Agricultural Research brought out first edition of *Handbook of Animal Husbandry* in 1962 for serving the end-users ranging from livestock owners to academicians. This is the Fourth revised and enlarged edition of *Handbook of Animal Husbandry* which includes 48 chapters under nine sections, such as Animal Genetics and Breeding; Animal Nutrition and Feed Technologies; Animal Management; Animal Reproduction; Animal Health Management; Animal Biotechnology; Animal Products, Technology and Machineries; Economics and Trade of Livestock and Poultry Enterprise; and Social Sciences. It has 19 new chapters like Impact of Biotechnology, Nanotechnology: Applications in Animal Sciences; Carbon Trading: Mechanisms and Opportunities in Livestock Sector; Intellectual Property Rights

Regime; Indigenous Technical Knowledge etc.; and old chapters were revised holistically. The fourth revised and enlarged edition of *Handbook of Animal Husbandry* will prove useful to the students, teachers, livestock/poultry farmers, and to especially those who visualize the economic growth of country with the support of livestock sector.

TECHNICAL SPECIFICATIONS

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