
RGCA
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Rajiv Gandhi Centre for Aquaculture

MPEDA, Ministry of Commerce and Industry, Govt. of India

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RGCA

Annual Report 2017-18

Published by

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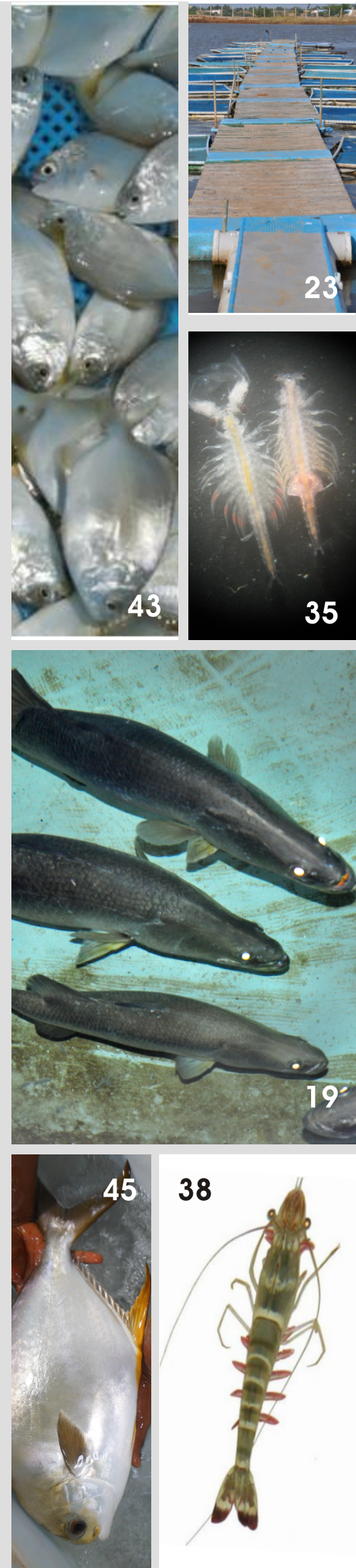
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Dr. A. Jayathilak, IAS

From the President's Desk

Greetings from RGCA!

The Indian Aquaculture Production has significantly increased over the last few years and I feel elated to share the significant contributions in the aquaculture sector made by the Rajiv Gandhi Centre for Aquaculture (RGCA), an exclusive R & D arm of MPEDA, designated as Aquaculture Technology Incubation Centre of MPEDA during the period 2017-18. The MPEDA RGCA has strived its best to work towards the Blue Revolution through its ongoing project activities.

The year 2017-18 witnessed series of popularizing programmes on diversified aquaculture, hosted by RGCA at various regions across the country, fulfilling its prime mandate on dissemination of the technology for the benefit of the Society. The one received accolade is the Global Konkan Festival held at CIDCO Convention Centre, Navi Mumbai from 6th to 10th January, 2018.

MPEDA-RGCA has grown in stature in the sphere of societal benefit by providing value added training and technical services to farmers, entrepreneurs, especially to the women self-help groups on farming of different cultivable species and sensitizing them on sustainable aquaculture technologies. The demonstration farms of RGCA established at Karaikal, U.T. of Pondicherry, exclusively for the purpose of providing hands on field level trainings on aquaculture species is a testimonial for its socio-responsible oriented activities.

The demo-farm facilities of RGCA, registered training of more than 150 beneficiaries during this review period. The Technology Training and Administrative Complex (TTAC) conducted about 51 outreach activities on the latest trends in aquaculture of commercially important species. A broad

spectrum of participants including students, research scholars, fishers, farmers and entrepreneurs, participated in the training programmes.

At the technology front, the flagship projects of RGCA such as the projects on Tilapia, Seabass, mudcrab and the marine finfish (Cobia, Pompano) continued to fine tune their existing technology thus enhancing the production and supply of seeds.

The Aquatic Quarantine Facility for L. vannamei, the Country's one and only centralized quarantine unit, operated by the RGCA successfully quarantined more than 2 lakh vannamei brooders that were imported to India, during the current review period which contributed to approximately 10 lakh Tons of disease free shrimp production in our Country.

RGCA also teamed up with

the Bharathidasan University, Tiruchirapalli, to provide their research facilities and expertise to guide research students pursuing doctoral degree in the field of Marine Science. The institute also pumped in efforts to minimize the expenditure incurred by all the projects without compromising the quality of the outcome. I am extremely happy to mention here as a President of RGCA that the year 2017-18 is one of the remarkable years for this Centre which reached self-sustainable level by generating income through R & D produces.

I thank the team for their constant pursuit to improve their skills and knowledge on the subject which had helped the organization to scale up-greater heights in the field of commercially oriented aquaculture research. I also thankfully acknowledge the support rendered by the Hon'ble

Minister of Commerce & Industry, and other officials in the MoCI, New Delhi and officials of MPEDA, Kochi.

Dr. A. Jayathilak, IAS
Chairman MPEDA &
President RGCA

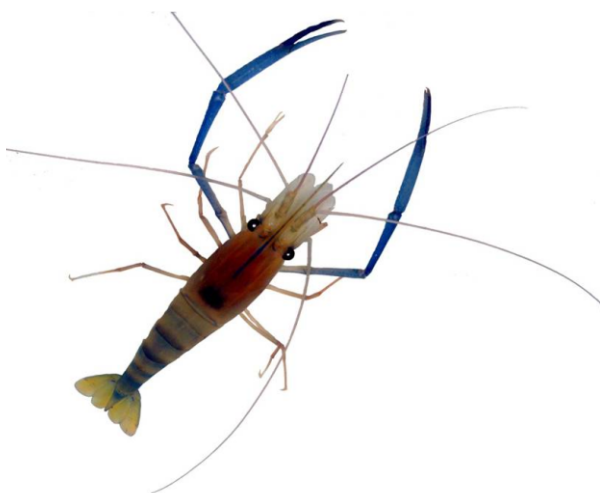


The Organization at a Glance

Rajiv Gandhi Centre for Aquaculture (RGCA), the Research and Development arm of the Marine Products Export Development Authority (MPEDA), Ministry of Commerce and Industry, Govt. of India focusses on commercially oriented research which is required for the aquaculture sector of the Country. The Centre plays pivotal role in implementing various technology development programmes on export oriented, diversified aquaculture species. The plan schemes are implemented by MPEDA under the head Research & Development. The Centre is registered under Tamil Nadu Societies Registration Act, 1975 on January 5th 1996 and has been functioning as a Society since then. The Head Quarters of RGCA is established at Sirkali, Nagapattinam District, Tamil Nadu.

RGCA has developed unique state-of-the art infrastructure facilities and expertise to fulfil its mandate on development and dissemination of sustainable aquaculture technologies. The projects of RGCA were implemented with a budget outlay of Rs. 133 Crores and Rs. 237.21 Crores on the 11th and 12th Plan period respectively.

An Executive Committee comprising of members from offices of MPEDA, MoC& I, ICAR, DBT, Commissioner of Fisheries from the States of Andhra Pradesh, Tamil Nadu & Gujarat; Director of Fisheries of Kerala, Tamil Nadu, Andaman & Nicobar Islands and the U.T of Pondicherry, constitute the governing body of RGCA. The Chairman MPEDA is the President RGCA and the Chairman of the Executive Committee.

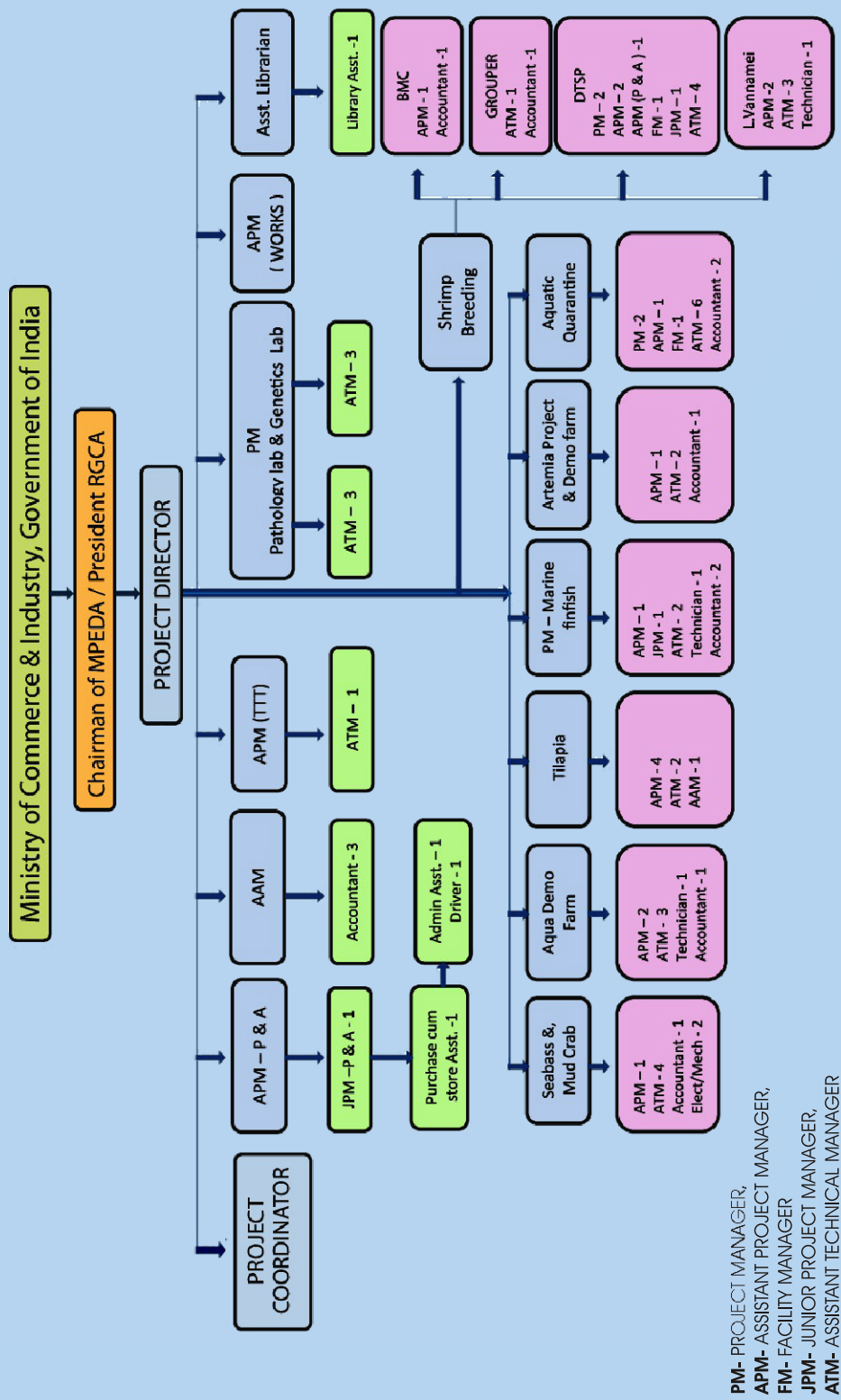


MEMBERS OF THE EXECUTIVE COMMITTEE FOR THE YEAR 2017-18

Sl. No.	Name & Organization	Designation & Period
1	Dr. A. Jayathilak, I.A.S, Chairman, MPEDA / President, RGCA	President, April-March
2	Shri. B. Sreekumar, Secretary, MPEDA	Member, April-March
3	Shri. Seetharama Raju, Additional Director, Department of Fisheries, Andhra Pradesh	Member, April-March
4	Dr. J Natarajan, Deputy Director of Fisheries & Fishermen Welfare, Govt. of Pondicherry (attended in place of Shri. A. Vincent Rayar, Director)	Member, April-March
5	Smt. E. V. Deepa, Chief Accounts Officer, MPEDA	Member, April-March
6	Shri. T. Dola Shankar, IOFS, Director (M), MPEDA	Member, April-March
7	Shri. RamashankarNaik, I.A.S, Commissioner of Fisheries, Andhra Pradesh	Member, April-March
8	Dr. Paul Pandian, Fisheries Development Commissioner, MoA	Member, April-March
9	Dr. A. S. Ninawe, Sr. Advisor, New Delhi	Member, Up to March-2017
10	Dr. S. Kandan, Project Director, RGCA (since January 2017)	Member, April-March

MEMBERS OF THE GENERAL BODY MEETING FOR THE YEAR 2017-18

Sl. No.	Name & Organization	Designation & Period
1	Dr. A. Jayathilak, IAS, Chairman, MPEDA / President, RGCA	President, April-March
2	Shri. B. Sreekumar, Secretary, MPEDA	Member, April-March
3	Shri. Seetharama Raju, Additional Director, Department of Fisheries, Andhra Pradesh	Member, April-March
4	Dr. J. Natarajan, Deputy Director of Fisheries & Fishermen Welfare, Govt. of Pondicherry (attended in place of Shri. A. Vincent Rayar, Director)	Member, April-March
5	Smt. E. V. Deepa, Chief Accounts Officer, MPEDA	Member, April-March
6	Dr. S. Kandan, Project Director, RGCA	Ex officio Member, April-March
7	Dr. Ram Mohan, Joint Director (Mktg.)	Member, April-March
8	Shri. C. Wilson, Deputy Director (Aqua.), MPEDA, RC, Nagapattinam	Member, April-March





RGCA's MISSION



- To develop, introduce and disseminate world class sustainable technologies in aquaculture.
- To provide consultancy and technical services to the entrepreneurs, farmers and Govt. Departments for establishing aquaculture units.
- To establish Technology Development Centres in Aquaculture in various locations in India for developing and disseminating appropriate technologies for scientific aquaculture.
- To scale up the technologies developed in research institutes by joining hands with the concerned scientists and disseminate the same through extension, education and demonstration programmes.
- To conduct pilot scale operations and to set up demonstration farms to popularize the technologies developed/acquired.
- To assist National Institutes, Agencies both in public as well as in private sectors for developing innovative technologies which are having scientific application.
- To introduce proven aquaculture technologies for the selected species which are commercially successful elsewhere in the world but not yet introduced in India. The centre will buy the technology from national or international source, blend the same under Indian condition with local technology if available and sell the same to Indian entrepreneurs and Govt. Departments after assuring the commercial viability.





Ongoing Projects & Locations

RGCA operates 11 important aquaculture projects spread over 16 different specific locations across the Country. These are:

1. **Technology Transfer Training and Administrative Complex (TTAC)** - Sirkali, Nagapattinam District, Tamil Nadu. The Head Quarters of RGCA functions from this complex
2. **Aquatic Quarantine Facility (AQF)** for *L.vannamei*, Neelankarai, Chennai, Tamil Nadu.
3. **Seabass Hatchery Project** Thoduvai, Nagappattinam District, Tamil Nadu
4. **Mud Crab Hatchery Project** Thoduvai, Nagappattinam District, Tamil Nadu
5. **Aquaculture Demonstration Farm**
 - a. Karaikal, UT of Puducherry
 - b. Mahendrapalli, Sirkali Taluk, Nagapattinam District, Tamil Nadu
6. **Domestication of Tiger Shrimp Project (DTSP)**
 - a. Amkunj, Middle Andamans
 - b. Kodiaghat, South Andamans
 - c. Kanyakumari, Tamil Nadu
7. **Artemia Project**
 - a. Tharuvaikulam, Tuticorin, Tamil Nadu
 - b. Artemia Demonstration Farm, Uppoor, Ramanathapuram, Tamil Nadu
8. **Broodstock Multiplication Centre (BMC) for *L. vannamei***
(TASPARC: Andhra Pradesh Shrimp Seed Production, Supply and Research Centre), Vishakhapatnam in Andhra Pradesh.
9. **GIFT - Tilapia Project** - Manikonda, Krishna District, Andhra Pradesh
10. **Pilot Scale Marine Finfish Hatchery Project (MFHP)**
 - a. Pozhiyur, Thiruvananthapuram, Kerala
 - b. Cage Culture Project - Muttom, Kanyakumari District, Tamil Nadu
11. **Grouper Project**
Rutland Island, South Andamans

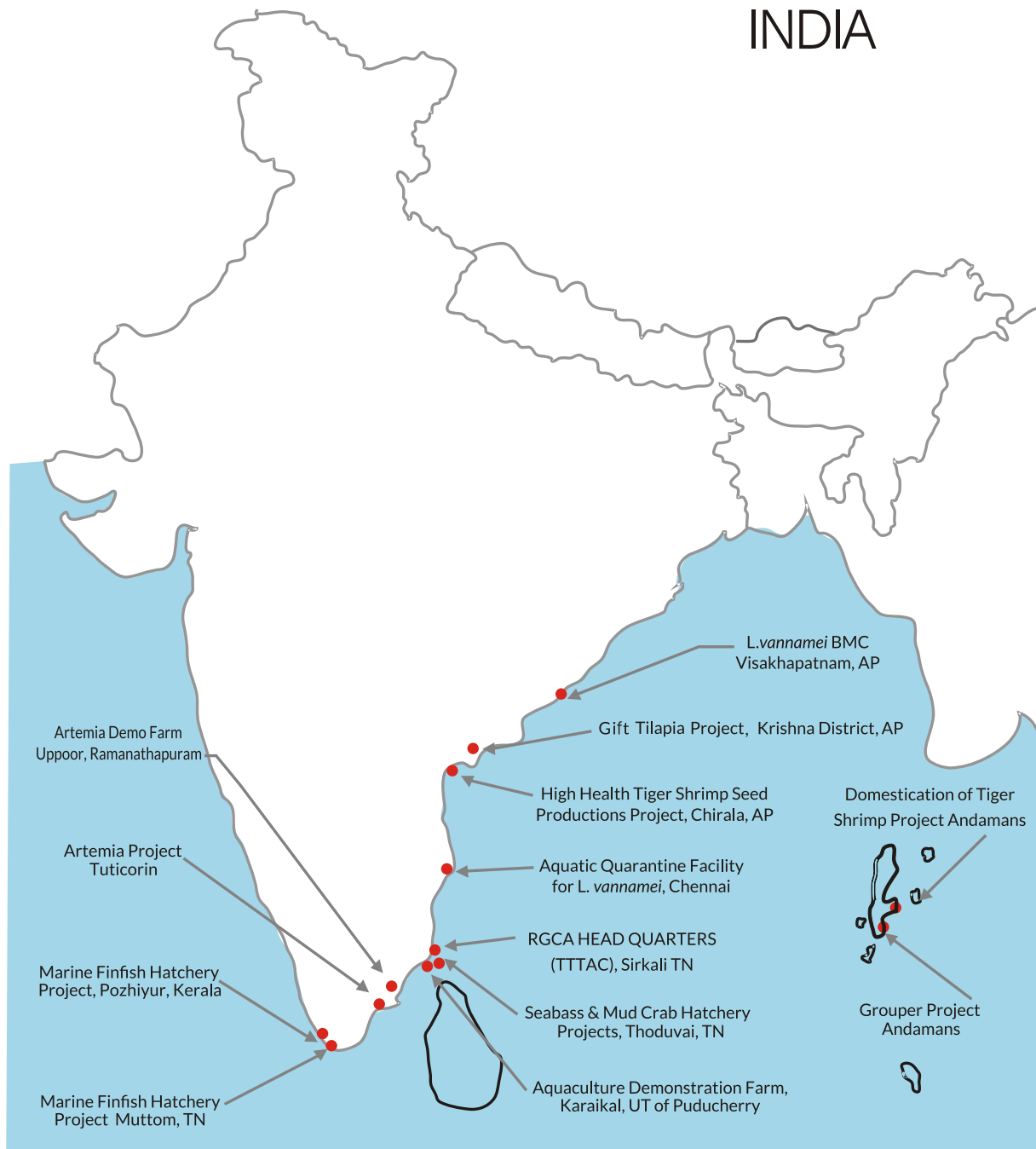
Full addresses of the above locations, please see page



RGCA

Project Locations

INDIA





Executive Summary

The significant achievements in the field of research and technology development in the various aquaculture projects conducted by RGCA during the year 2017-18 is summarised in the ensuing report.

- The Seabass Hatchery facility at Thoduvai, recorded a production of 3.50 million larvae of Asian Seabass (*Lates calcarifer*) with year round breeding. The hatchery distributed 2.09 million seabass seeds to various categories of beneficiaries including farmers, Research Institutes and ICAR Institutes.
- The Mangrove Mud Crab Hatchery facility produced 8.87 lakhs of crab instars (crab seed) of size range of 0.4-0.6 cm, through thirty production cycles. The increased seed production by the hatchery indicated success in standardization of technology for crab seed production through the adoption of green water system and use of probiotics in larval rearing.
- The Aquaculture Demonstration Farm successfully reared mud crabs in nurseries at an average survival rate of 73.2% and seabass at the mean survival rate of 85 %.



Seabass Cage Farming



- In the Domestication of Tiger Shrimp Project, Andamans, twenty three 6th generation of SPF *Penaeus monodon* (tiger shrimp) families were produced and reared up to maturity. In addition to this, twenty five 7th generation tiger shrimp families were also produced.
- The Artemia Project facility produced 351.9 kg of artemia biomass and 135.2 kg of WSSV free dry cysts during the current review period.
- The Broodstock Multiplication Centre for *L. vannamei* (BMC *L. vannamei*) at Vizagapattinam produced 41,394 numbers of SPF *L. vannamei* brooders and distributed 32,030 quality brooders to 48 hatcheries.
- The GIFT - Tilapia Project at Vijayawada recorded production of 45,27,848 nos. of all male GIFT seeds and supplied to various beneficiaries from 77 batches. The project also supplied 1000 nos. of GIFT Broodstock fingerlings to farmers to rear upto GIFT - Broodstock.
- The Marine Finfish Hatchery Project facility of RGCA at Pozhiyoor, Kerala continued captive spawning of cage farmed cobia brooders and wild caught Pompano brooders. The project team also successfully developed an indigenous sea water treatment system for removal of Iron and to minimize hardness of the source water. An in - house

Semi Submerged Internal Lighting System (SSILS) for intensive larval rearing was also developed by the project. The facility produced 1,22,351 pompano seeds and 15,861 cobia seeds from three successful spawns each. 95,069 pompano fingerlings, 2,960 cobia seeds and one lakh of pompano hatchlings were supplied to farmers and ICAR Research Institutions, by the project facility.

- The Sea Cage Demonstration Farm at Muttom harvested a total of 6.1 MT of Cobia Fish and 1.67 tons of marketable sized Pompano fish.
- The project on Aquatic Quarantine Facility for *L. vannamei* registered import of 257101 nos. of SPF *L. vannamei* brooders, in 359 batches. The overall mean quarantine survival delivered by the facility during the period under report was 92.8%. In addition to this, the facility recorded import of 8 batches of *L. vannamei* post-larvae imported by RGCA from M/s Oceanic Institute, Hawaii, for rearing broodstocks in BMC, Vizagapattinam.
- The Technology Transfer Training and Administrative Complex (TTTAC) conducted a series of training programmes for 393 beneficiaries including farmers, entrepreneurs, students, researchers, Govt. officials and academicians. The programmes were focused on aqua farming of Seabass, Mud Crab, GIFT tilapia, Live feed culture for marine hatcheries, Shrimp Disease Diagnostics and Application of Molecular Markers, etc. About 12% of the beneficiaries took farming activities on Seabass, Mud crabs, GIFT, etc., after completion of the training. Apart from this, TTTAC also conducted 43 outreach programmes on New Aquaculture Technology Developments.
- The Central Aquaculture Pathology Laboratory (CAPL) renewed its NABL accreditation for another two years. The lab completed PCR testing for 988 samples during the current review period. About 900 tests were also conducted under the National Surveillance Programme for Aquatic Animal Diseases (NSPAAD) in collaboration with NBFGR, Lucknow. Disease surveillance was also

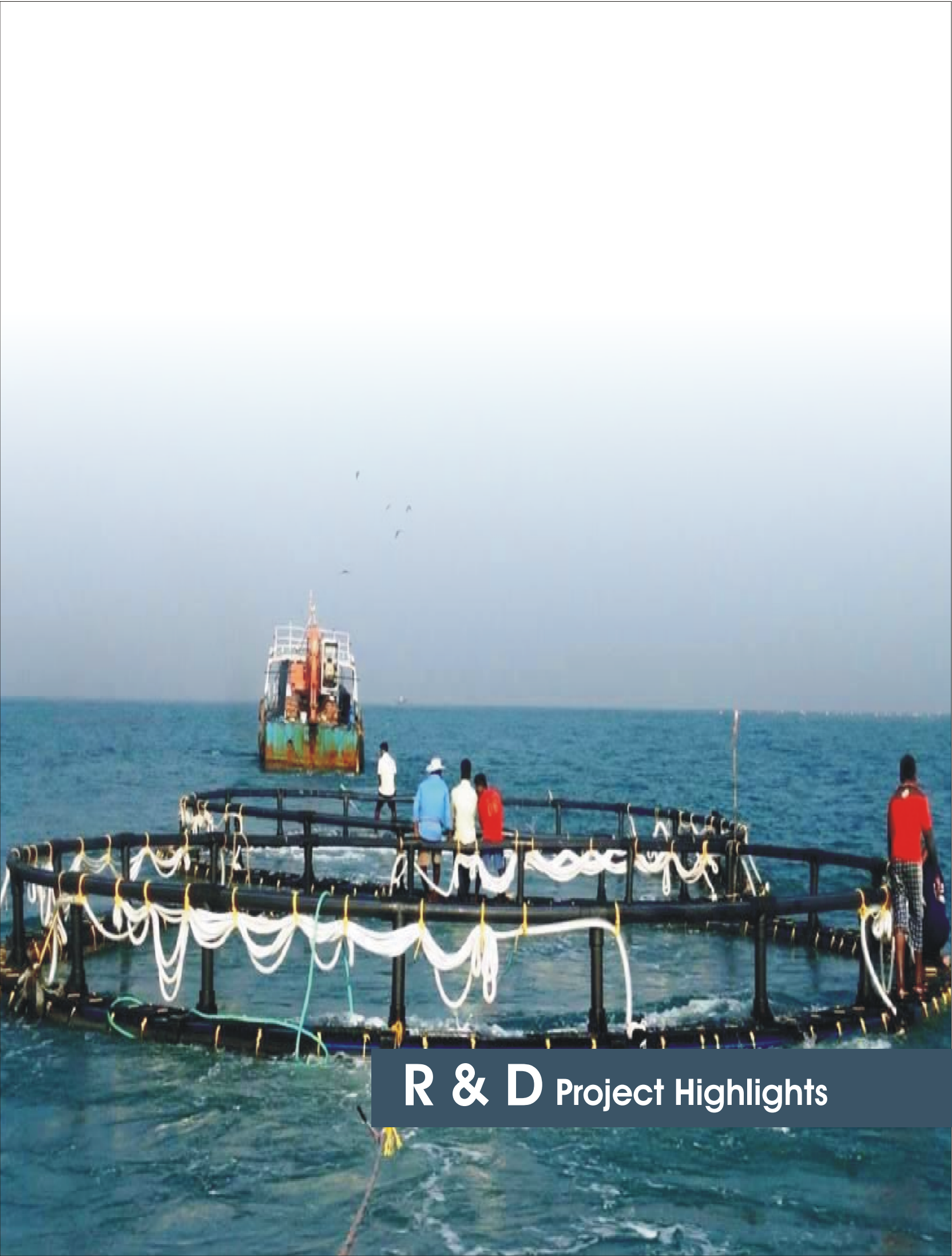
conducted for Tilapia Lake Virus (TiLV) in 53 suspected samples collected from Tamil Nadu, Kerala, Andhra Pradesh, Orissa and Maharashtra.

- NABL accreditation of the Genetics Lab was also extended for a period of two years. The lab published 29 crustacean genomic sequences in NCBI Gen Bank.

The period under review also registered the closure of the following project facilities

- Domestication of tiger shrimp project facility located at OSSPARC, (The Odisha Shrimp Seed Production, Supply and Research Centre), Gopalpur on sea, Odisha
- High Health Tiger Shrimp Seed Production Unit located at Chirala, Andhra Pradesh
- Grouper Project facility situated at Kodiaghat, South Andamans
- Scampi Broodstock Development Project at Kankipadu, Krishna District, Andhra Pradesh.





R & D Project Highlights



Seabass Hatchery Project

Project Location : Thoduvai, Sirkali, Nagapattinam District, Tamil Nadu

Year of Commencement : 2000

Scope of the Project

Asian Seabass known by the scientific name *Lates calcarifer* is an important food fish which has high market value. The fish inhabits coastal seas, estuaries and lagoons.

The project envisages year round supply of Seabass seed to the aquaculture industry for augmenting aquaculture production mainly through cage farming in earthen ponds, open water systems, marine cages and coastal waters. RGCA embarked on this project with a view to initiate species diversified aquaculture in the

country. This is needed for the sustainability of the aquaculture sector in the country. Culture of different species would also avoid excessive production or exploitation of a single species.

Description of the facility:

The Seabass Hatchery project facility is located in a 13.2 acre area at Thoduvai Village, Sirkali Taluk, Nagapattinam District. The hatchery unit comprises of dedicated sections for Quarantine, Broodstock housing, Spawning, Larval rearing and Fingerling rearing area. It also has a full-fledged live feed unit for Micro algae, Rotifer and Artemia culture. Supporting systems



Out Side view of Seabass Hatchery Unit of RGCA

for seawater intake and treatment, fresh water intake, reservoirs, overhead tanks, filtration, aeration and power back up systems are also in place. The annual capacity of the hatchery is 2-3 million seeds (1 - 5 cm size) per year.

Other major infrastructure facilities in the hatchery complex includes a dedicated RAS (Recirculation Aquaculture Systems) with thermo and photo controls for broodstock maintenance.

Activities & Accomplishments

Broodstock Collection & Quarantine:

The current review period registered recruitment of 35 Seabass brooders from wild thus maintaining the brooder population of 72 brooders in the hatchery. The brooders were introduced after quarantining for a period of forty days. The quarantined and conditioned stocks were maintained in broodstock housing tanks fitted with Recirculation Aquaculture System (RAS).

The maturity condition of the fish is sustained by ensuring a congenial environment through maintenance of constant water quality parameters.



Breeding and Seed Production:

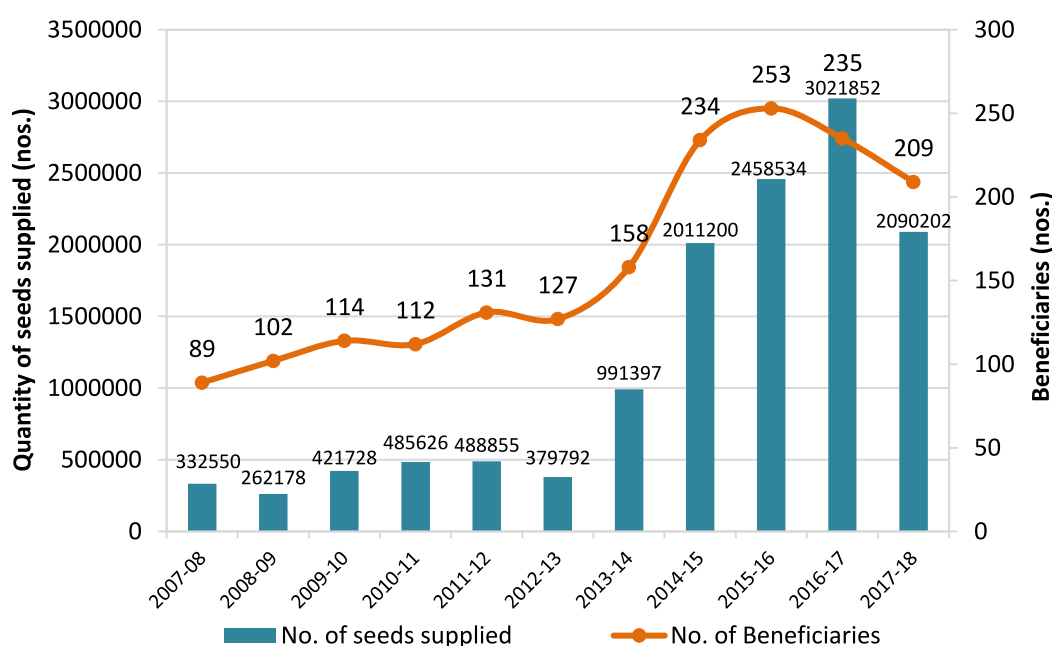
The facility accomplished in obtaining four successive spawnings of captive seabass during the period. About 3.50 million larvae were obtained and stocked in the larval rearing tanks. The project supplied a total of 2.09 million seabass seeds including fry and fingerlings to the farmers,

Universities, Research Institutes, Fisheries Departments, ICAR Organizations, MPEDA and RGCA Demonstration Programmes. The overall survival rate from hatching to seed production was recorded as 61.1 %.

Details on Seabass seed supplies for the period 2017-18

Category	Tamil Nadu	Andhra Pradesh	Kerala	Karnataka	Maharashtra	Pondicherry	Total
Farmers	112890	1633060	122676	1000	3400	3350	1876376
Government Organizations	8130		57975				66105
NGO/Pvt. Company	2200		14011		27158		43369
Universities/ Research Institutes	1900						1900
RGCA - ADF						44522	44522
CIBA/CMFRI/CIFE	1000			35770	500		37270
MPEDA Demo.			20660				20660
Total fry/fingerlings	126120	1633060	215322	36770	31058	47872	20,90,202

Category - wise supply of Seabass seeds



Year- wise details of Seabass seeds supplied by RGCA

Spawning and Larval Rearing

Spawns occurred	4 batches
Hatchlings stocked in LRT	3.50 million
Seeds (Fry/Fingerlings) supplied	2.09 million
Survival rate	61.1 %

Supply of Seabass Seeds:

The hatchery supplied seeds to various regions across the country. The beneficiaries from these States were mainly farmers, private entrepreneurs, Research organizations, ICAR Institutions and

representatives from Govt. and Non- Govt. bodies. The reduced production recorded during the review period, was due to heavy rain, drop in salinity and temperature, .





Mangrove Mud Crab Hatchery Project

Project Location : Thoduvai, Sirkali, Nagapattinam District,
Tamil Nadu

Year of Commencement : 2004

Scope of the Project

Mangrove Mud Crab (*Scylla serrata*), is highly sought as quality food for consumption in domestic and international markets. They fetch high market value due to their excellent taste, texture and nutritive value. Exploitation of crabs and degradation of their natural mangrove and wetland habitats affect the wild stocks as well as the livelihood of the coastal people dependent on this resource. The double-edged demand capture of adults from wild for direct marketing and similarly capture of juveniles for aquaculture for mud crabs in addition to mangrove degradation urged RGCA to establish a Pilot Scale Mud Crab Hatchery, which is the first of its kind in India.

The project focuses to augment the aquaculture production of mangrove mud crab by standardizing the seed production technology and to implement ranching programme in order to enhance the natural stock in the wild.

Description of the facility:

The Mangrove Mud Crab Hatchery of RGCA is a state-of-the-art facility equipped with all infrastructure facilities for continuous seed production. It is designed with a capacity to produce around one million Crab instars per annum. This facility is the only one of its kind in India and consists of dedicated broodstock holding and spawning areas, larval rearing section and live feed sections with all required ancillary supporting systems.



Mangrove Mud crab hatchery facility at Thoduvai TN

Activities & accomplishments:

Details of broodstock collection, quarantine, spawning, hatchling, seed (crabin star) production and supply for the period under review are furnished below:

Collection and quarantine of matured crabs:

Wild caught matured crabs were used for seed production. 143 matured female crabs in the size range of 550 to 850 gms, were collected from coastal areas of Tamil Nadu, Andaman & Nicobar Islands, Karaikal and Andhra Pradesh. These were quarantined at the facility prior to conditioning for seed production. The crabs were screened for White Spot Syndrome Virus (WSSV) and only WSSV free brooders were stocked in broodstock holding tanks for seed production.

Spawning and hatching:

About thirty successful spawning batches were obtained at the hatchery from the wild collected crabs during the current review period. The quantity of healthy zoea produced from 30 spawners were registered as 40 million. Out of these, 21.9 million zoea were stocked in larval rearing section and the remaining 18.1 million were ranched into the nearby open sea and estuary.

Crab seed production:

During the period under report, Repeating several times which approximately 8.09 lakhs of crab instars (crab seed) of size range of 0.4 - 0.6 cm were produced. The consistent production of seeds in the hatchery indicated success in standardization of technology for seed production through the adoption of green water system and probiotics used in larval rearing. The maximum survival rate achieved in larval rearing (from zoea to crab instars) during the year was around 10%. The steady increase in survival rate over the years provide ample scope for viable commercialization of hatchery production of mud crab seed through

Spawning and Larval Rearing

Spawns occurred during 2017-18 (Nos.)	: 55
Hatchings obtained (Nos.)	: 30
Zoea obtained (Nos.)	: 40 million
Zoea stocked in LRT Section (Nos.)	: 21.9 million
Zoea ranched (Nos.)	: 18.1 million
Crab instars supplied (Nos.)	: 0.809 million
Survival rate (%)	: 3.69%

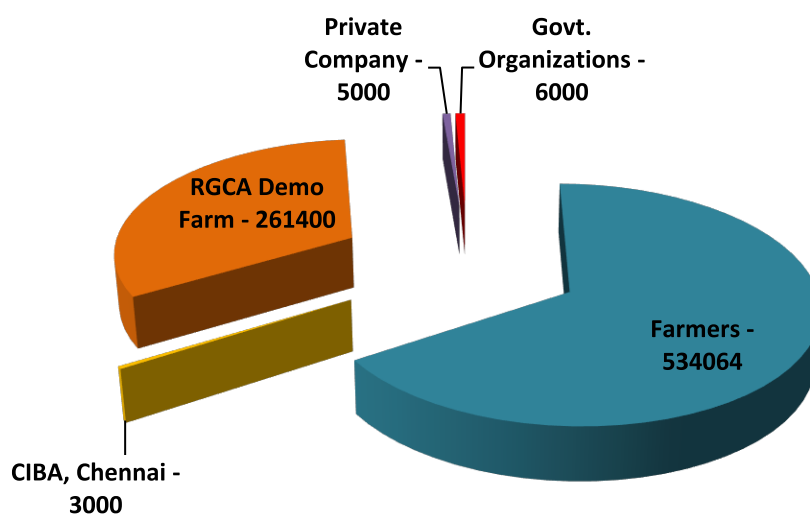
Promotional supply of Crab instars:

To popularize crab aquaculture and to augment production, the hatchery produced crab seeds were provided to farmers at a subsidized rate of Rs. 6/-. The details on supply of crab instars to different category of buyers are shown in the table.

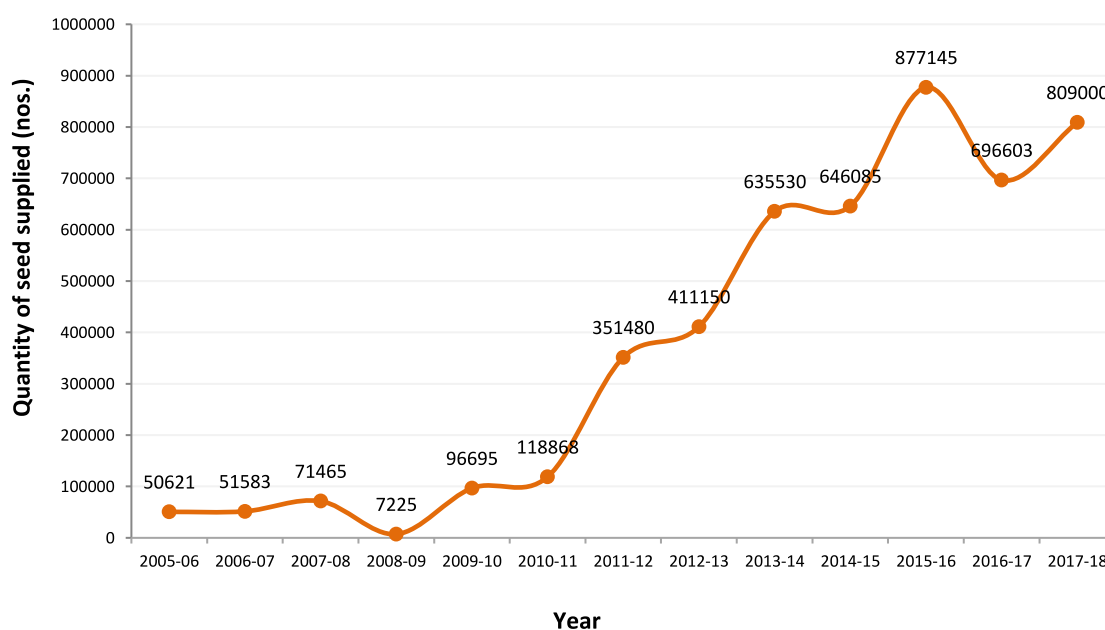
Quantity of Crab instars supplied (nos.)

Category	Tamil Nadu	Pondicherry	Andhra Pradesh	Maharashtra	West Bengal	Total
Farmers	14,250	12,000	4,95,814	5,000	7,000	5,34,064
CIBA, Chennai	3000					3000
Govt. Organizations	1,000		5,000			6,000
ADF, RGCA			2,61,400			2,61,400
Private Company	5000					5000
Total	23,250	2,73,400	5,00,814	5,000	7,000	8,09,464

Region- wise supply of Crab instars



Category wise supply of Crab instars from the RGCA hatchery



Year wise supply of Crab instars from the hatchery



Aquaculture Demonstration Farm

Project Location : Karaikal, UT of Puducherry

Year of Commencement : 2000

Scope of the Project

This project was initiated to conduct demonstration programmes to disseminate improved technologies so as to gain higher production of commercially important fish and shell fish. It focusses mainly on the development and demonstration of viable technologies in nursery rearing and grow-out farming of Asian Seabass and Mangrove Mud Crabs in different farming systems such as earthen ponds, hapas, pens, open ponds etc.

Description of the facility:

The facility has set up demo ponds for conducting aquaculture activities for various fish and shellfish species. The demo farms are located at two separate sites, one at Karaikal, Union Territory of Puducherry and the other at Mahendrapalli, Sirkali Taluk, Nagapattinam District of Tamil Nadu.

The first site has a total extent of 12 acres of leased land comprising of four grow out ponds and one nursery pond (0.20 ha.) with water spread area of 3.90 Ha. The pond systems were developed during the year 2000 and later it was renovated during 2015 - 16.

The second site has an area of 18.72 acres and is of own land of RGCA located on the bank of the Kollidam River. This site contains, ten numbers of 0.40 - 0.70 ha grow out ponds of water spread area of 5.06 ha.

Activities & accomplishments:

Nursery rearing of crabs and supply of crablets: Crab instars (of size : 3.0 - 5.0 mm) produced at the RGCA hatchery were stocked in nursery hapas and reared to crablets (Size : 2.0 - 3.5 cm) in the demonstration farm. During the period under report, 2,64,293 nos. of crab instars in 15 batches were received from RGCA's Mud Crab Hatchery Thoduvai. The crab instars received were reared to crablets in nursery hapas deployed in the demo ponds of the farm facility. The percentage of survival obtained from instar to crablet stage was 80%, yielding to 2.1 lakhs. Out the 2.1 lakhs seeds produced, 1,78,426 nos. were supplied to the farmers, Self Help Groups (SHGs), MPEDA Demonstration programmes and Research Institutions. Crablets reared from the RGCA farm were also supplied to the farmers in the neighbouring States such as Andhra Pradesh, Kerala, Goa, Odisha, Maharashtra and Puducherry without much transit loss.



Stocking of crab instars in hapa



Harvesting of crablets

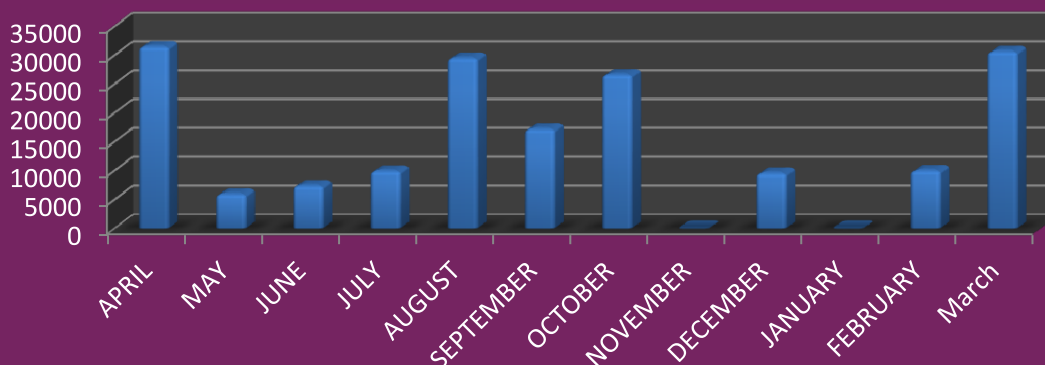


Washing and grading of Crablets



Graded crablets for sale

MANGROVE CRAB LETS MONTH WISE SALES DETAILS 2017-18



Mangrove crab grow-out farming in open pond:

Mangrove crab farming was done by stocking crablets at a density of 0.5 nos./m² in 0.75 ha pond. 3,225 nos. were stocked in the pond during May 2017. Regular assessment on growth, feed intake, water quality etc. were done throughout the farming period. About 298.94 kg of size range 350gms. - 1.4kg.were partially harvested from the pond and supplied to the exporters.

Demonstration of cage and open pond culture of Seabass:

Demonstration of Cage Culture of Seabass at early fingerling stage were done in three periods. 4,422 nos. were stocked during May-July 2017 and 2,500 were nos. stocked during August 2017, respectively.

The fingerlings were stocked in the cages after nursery rearing. The first batch stocked attained 90 - 240 gms, with a survival of 85%. The estimated total biomass recorded was 3.9 ton.

The second and third batches were maintained in seabass cages in pond 2. The second batch attained 250 - 480 gms.with estimated survival of 95.1% . The biomass produced during the review period was 2.5 ton.

The third batch attained size range of 125gms. -305 gms with estimated survival of 96.7%. The biomass recorded was about 0.23 ton. From this batch 1000 nos. of fishes of size range 14 - 15.5 cm. were supplied to the local farmers for further culture.



Mud crab harvest by ring net



Mud crab harvested for sale



Seabass harvested from cages



Seabass harvested from open pond

Aquaculture Demonstration Farm, Mahindrapalli

In Mahindrapalli, 30,000 nos. seabass seeds were stocked. The farm produced and supplied 3,720 fingerlings, during the current review period. The demo farm also produced and supplied 148 kgs. of shrimp, 35 kgs seabass and 142kgs of other edible commercial finfishes to local exporters.



Domestication of Tiger Shrimp Project

Shrimp aquaculture is a major farming activity undertaken by the rural entrepreneurs along the coast of India providing employment and livelihood support to more than 1 million people in the coastal villages. Shrimps are highly priced seafood item and are mostly consumed in developed countries and hence shrimp prices are fully dependent on the export market. Shrimp farming faced varied challenges during the last two decades, such as severe crop loss due to diseases, increased production cost, decline in profitability, market issues, etc. Introduction of disease free domesticated Pacific White Shrimp (*Penaeus vannamei*), has resulted in considerable increase in shrimp production in recent years. The Specific Pathogen Free stocks of the Pacific shrimp are available across the world for seed production and farming. Majority of the Indian shrimp farmers switched on to vannamei farming considering its advantages. This trend is likely to outpace the culture of black tiger shrimp (*P. monodon*), which is our native shrimp species. Therefore, to curtail this trend, it is essential that domesticated SPF stocks of Black Tiger Shrimp are produced and supplied to the Indian farmers.

Domestication of Tiger Shrimp Project was initiated at Andaman & Nicobar Islands during the year 2005 and Pilot scale operations were carried out to develop skills and standardize protocols for selective breeding, disease diagnostics and bio-security. Tiger shrimp domestication project is ideally established at Andamans considering excellent bio-secure conditions prevailing in this Island which is a pre-requisite for a Specific Pathogen Free domestication programme. Andaman Sea is also blessed with genetically diverse population of Black Tiger shrimp that are relatively clean from any kind of infections which is essential for development of founder families for the selective breeding programme. Domestication of Tiger Shrimp Project was dedicated to the Nation on 28th February 2014 by then Hon'ble Union Minister for Commerce & Industry, Govt. of India.

Description of the facility:

This project has 4 main sub-components:

a) The Pre-primary and Primary Quarantine Unit (PPQU & PQU):

These units have been established at Amkunj in Middle Andamans, about 200 km away from Port Blair for the development of SPF founder families for the selective breeding programme. The unit has the capability to screen around 12-15 families per annum.

b) The Secondary Quarantine Unit (SQU):

This unit has been established at Kodyaghat, South Andaman, comprises of 12 quarantine cubicles that can hold 12 founder families until they are transferred to the Nucleus Breeding Centre. Disease surveillance of the selected founder families and selection of stock for desired characteristics are the major activity of this unit.

c) The Nucleus Breeding Centre (NBC):

The NBC is established at Kodyaghat with a total floor area of 3,900 sq. m. This is a major unit of the project where the most valuable germ-plasm of SPF families are maintained and used for selective breeding. The traits that are considered for improvement are faster growth to bigger size shrimps, better reproductive performance, better feed conversion ratios and resistance to diseases. This facility is one of its kind in India developed with all advanced aquaculture technology with infrastructure facilities consisting of sections for maturation, spawning, hatching, live feed, nursery and grow out. It is designed to produce and rear a large number of SPF tiger shrimp families developed from around 60 founder families at a time.

Activities and accomplishments:-

Primary Quarantine Unit, Amkunj:

During this review period seven founder families were produced in which six founder families were qualified and stocked in Secondary Quarantine Unit for further rearing.

Secondary Quarantine Unit:

Successfully shifted thirteen first generation founder families brood stock to NBC- Maturation unit to produce successive shrimp generations. At present, shrimps belonging to six G1 founder families were successfully reared in this unit.

Nucleus Breeding Centre:

1) Maturation Unit:

Successfully produced 2 third generation, 7 fourth generation and 30 seventh generation shrimp families during the period and shifted to larval rearing unit for further rearing.

2) Larval Rearing Unit:

Larvae of the two, third generation, 7 fourth generation and 30, seventh generation tiger shrimp families were reared in larval rearing unit. Post larvae belonging to 1, third generation, 5 fourth generation and 25, seventh generation tiger shrimp families were successfully produced and shifted to NBC-Nursery Unit.

3) Nursery Unit:

One, third generation, five, fourth generation and twenty five, seventh generation families of tiger shrimp were successfully reared in this unit. Two, second generation, six, third generation, one, fourth generation, eight, sixth generation and

twenty one, seventh generation families of tiger shrimp juveniles/sub adult stage were transferred to NBC- Grow out unit for further rearing.

4) Grow Out :

Successfully reared two, second generation, six, third generation, one, fourth generation and twenty three, sixth generation families of shrimp juveniles to brood stock size and shifted to NBC- Maturation Unit for the production of successive shrimp generations. At present, twenty one, seventh generation families are being reared in Grow out A & B Units.

Bio-secure Pellet Feed Preparation Unit:

Produced and supplied 388 kgs. of bio-secured shrimp pellet feed to different units of DTSP.

Major Achievements:-

- Twenty three, sixth generation SPF tiger shrimp families were produced and reared up to maturation size.
- Twenty five, seventh generation SPF tiger shrimp families were produced successfully during this review period from the sixth generation SPF shrimp families.
- Two, second generation, six, third generation and One, fourth generation families were reared up to brood stock size in addition to the sixth generation SPF tiger shrimp families.



NBC Nursery Recirculation System



Artemia Project

Project Location : Tharuvaikulam, Tuticorin, Tamil Nadu
Uppoor, Ramanathapuram, Tamil Nadu

Year of Commencement : 2007

Scope of the Project

Artemia is a live feed that has revolutionized Aquaculture industry globally and used for more than 85% of aquaculture species, mainly in shrimp hatcheries. India requires about 250 tons of dry artemia - cysts annually. A hatchery of 300 million seed production capacity needs 1-1.5 tons of dry cysts per annum. RGCA has succeeded in standardization of technology for indigenous production of Artemia - cyst and biomass through aquaculture in saline salt pan areas. The project envisages to disseminate the developed technology among Self-Help Groups, entrepreneurs and salt workers/ salt works companies interested in the vertical integration of Artemia Aquaculture and Salt production.

Description of the facility:

The Artemia Farm at Tharuvaikulam, Tuticorin extent over an area of 6.75 Ha., comprising of designated ponds for culture of artemia as well as micro - algae. Eight ponds were HDPE lined and remaining are earthen types. A system of evaporation ponds is also present in the farm. A micro - algae culture laboratory is also available in the farm for maintenance of algal strains. A separate processing and packing section is present for processing and storing the farm produces. A quality evaluation lab is present for assessing the quality of Artemia Cyst and Biomass produced in the farm.

Activities and Accomplishments:

Production of Artemia Cysts

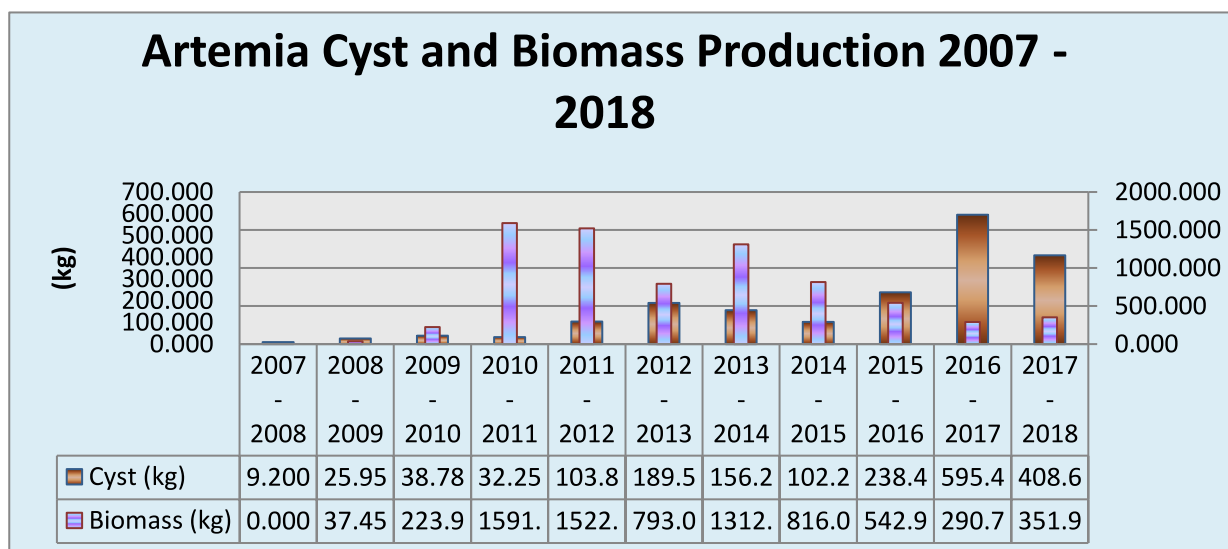
About 127.960 kgs. of wet cyst and 11 tins of dry cysts, which was remaining stock from the previous year harvest were made available for supply during the period under report. In the year 2017-18, about 408.65 kgs. of wet cyst was collected from the farm facility at Tharuvaikulam, Tuticorin. About 135.82 kgs. of dry cyst was produced from 491.61 kgs. of wet cyst. These were packed in 316 nos. of nitrogen flushed containers and 209 tins were supplied to Finfish and Shellfish hatcheries after quality evaluation. About 45 kgs. wet cysts were kept in drum for diapauses.

Production of Artemia Biomass

About 2.150 kgs. of frozen artemia biomass which was the remaining stock from the previous year harvest was supplied during the period under report. In addition, 351.9 kgs. of artemia biomass was harvested in the year 2017-18, from which 190.6 kgs. of frozen artemia biomass was supplied to the shrimp hatcheries, ornamental fish breeding units and research organizations. The remaining stock of 163.45 kgs was stored for future supply.

A view of the Artemia Project site, Tharuvaikulam





Artemia - Cyst and Biomass Production 2007 - 2018

Artemia Demo farm, Uppoor in Ramanathapuram Dist.

Year of Commencement : 2016

Scope of the Project

Based on the results from the various production trials conducted in RGCA - Artemia Project, Tharuvaikulam, an Artemia Demonstration Farm was also developed by the Institute at Uppoor, Ramanathapuram District. The demo farm caters hands-on training to the SHGs and interested entrepreneurs, thus paving the way for large scale production of Artemia-cysts required for the aquaculture industry of the Country. One of the primary objectives of the training is to empower the Socio-economic status of coastal community women group by providing hands-on training on Artemia- cyst and biomass production. The beneficiaries were also given exposure on the latest standardized techniques in pond management and hygienic practices in Aquaculture. The trained SHG members were engaged for the operation of Artemia Demo. Farm, Uppoor, Ramanathapuram District.

Description of the facility

The Artemia Demo. Farm at Uppoor extends over an area of 10 Ha. and comprises of 36 nos. of Artemia production ponds and 8 nos. of algal culture ponds. Among these, the algal culture

ponds were HDPE lined whereas the artemia culture ponds are earthen ponds. The facility is also equipped with a Micro-algae stock culture laboratory and indoor scale-up unit for maintenance of Algal strains. The entire farming area was covered by bird fencing to avoid bird's predation and entry of pathogens into the farm through birds.

Activities & Accomplishments:

Production of Artemia Cysts from Uppoor Demo Farm

About 47,710 kgs. of wet cysts and 10tins of dry cysts which was remaining stock from the previous year harvest were made available for supply during the period under report. In addition, in the year 2017-18, about 267.11 kgs wet cyst was collected. About 38.89 kgs. of dry cyst was produced from 142.42 kgs wet cyst. These were packed in 89 nos. of nitrogen flushed containers. 90 tins were supplied to finfish and shellfish hatcheries after quality evaluation. The remaining 7 tins of dry cysts were stored for future use and 172.4 kgs. wet cyst in saturated brine for curing.



Satellite Picture of Artemia Demo. Farm at Uppoor

Production of Artemia Biomass from Uppoor Demo Farm

During the period under report, 23.7 kgs. of Artemia biomass was harvested. The biomass was dried through Hybrid Solar Dryer and processed as Dried Artemia Flakes. 2,779 kgs. of the dried artemia flakes was produced and 0.25kg. was supplied to the RGCA - Seabass hatchery. The remaining stock of 2.53 kgs. of dried flakes was kept in store for future supply.

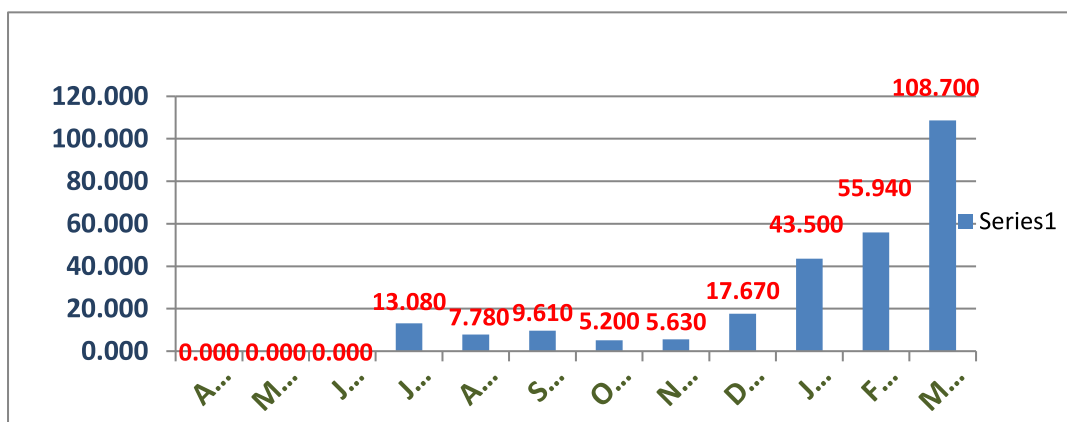
Infrastructure Development:

An eight inch borewell of 400m depth was erected for drawing in high saline water. It yielded saline water of the required salinity of 60 ppt. An in-house hybrid solar dryer was designed and fabricated at the farm facility for the production of artemia flakes. Exhaust fan and electric heaters

were fixed to maintain the set temperature of 60°C and to continue the drying process during the cloudy days. The loading capacity of the solar shed is about 50kgs.

Achievements:

RGCA Artemia Demo. farm achieved its optimum production rate of 150kgs. /Ha./Crop, during the current review period. It yielded an average wet cyst production of 5 kgs. / day from 3 Ha. water spread area especially by February March 2018 after altering the salinity and pH of algal pond water. A simple mechanical raker, was also designed by RGCA which is used as an alternative for the laborious manual raking process needed to condition the pond bottom for artemia culture.



Production of Artemia Cysts at the Demo. Farm during 2017-18



Hybrid Solar Dryer at Artemia Demo. Farm, Uppoor



Mechanical Raker in Artemia culture pond



Visit of Nepal Students at RGCA Artemia Project, Tharuvaikulam



Broodstock Multiplication Centre for *L. vannamei*

Project Location : Mangamaripeta, Bhimilipatanm,
Viskhapatnam, Andhra Pradesh

Year of Commencement : 2011

Scope of the Project:

Indian shrimp hatcheries have been importing SPF *L. vannamei* brood stock from Brood stock Multiplication Centres in USA, Singapore & other countries, by incurring high shipping cost and transit loss. High cost of broodstock also prompt hatcheries to source broodstock from shrimp ponds which ultimately results in the production of poor quality inbred seeds and subsequent possible crop loss to farmers.

Hence for sustaining the productivity and profitability of shrimp farmers, it is essential that the quality SPF *L. vannamei* seeds are provided to farmers at reasonable price. Keeping in view of this objective, during the year 2011, MPEDA-RGCA established the first State -of -the art Broodstock Multiplication Centre on pilot scale for *L. vannamei* in India at TASSPARC Facility, Visakhapatnam, in collaboration with M/s Oceanic Institute of Hawaii Pacific University, Hawaii, USA to provide consistent supply of high quality SPF *L. vannamei* selectively bred broodstock for good maturation performance, fast growth, disease resistant and better survival to the CAA approved hatcheries in the country. Brood stock distribution to the shrimp hatcheries commenced during April 2013. During March 2016, MoA approved to operate the facility as BMC for SPF *L. vannamei* in the same facility.

This project essentially consists of two units: Nucleus Breeding Program (NBP) and *L. vannamei* Broodstock Multiplication Centre (LvBMC). Genetically diverse shrimp families from the NBP which is located at Hawaii will be evaluated at a test farm in India for a 70 day in grow out and the best performing families will be selected. Offspring of these selected families will be transferred from NBP to the *L. vannamei* BMC of RGCA where they will be grown to brood stock and supplied to CAA approved shrimp hatcheries in India. Installed capacity of LvBMC was 45,000 broodstock per

annum and now the production capacity has been increased to 60,000 broodstock per annum.

Description of the Facility:

The Andhra Pradesh Shrimp Seed Production, Supply and Research Centre (TASSPARC) Facility of MPEDA has been modified for the development of BMC for *L. vannamei*. The entire operation is being carried out in two phases.

- * Phase-I Rearing system consists of 20 tanks for rearing of PL-15 to 15gm. size (10 tanks of 15 sq.m each & 10 tanks of 27 sq.m each).
- * Phase-II Rearing system consists of 16 tanks for rearing 15gm. shrimp to brooders (16 tanks of 40 sq.m each).
- * Algal mass culture system consists of 5 tanks (01 tank of 10 sq.m & 04 tanks of 27 sq.m each).

In addition to these above facilities, the LvBMC has a complete seawater intake and treatment system comprising of pumps of different efficiencies, reservoirs, ozone generating units, advanced UV filters, cartridge filters and sand / glass bead filters. The indoor algal production unit, re-circulation units, seawater chiller units, power back-up systems, aeration systems and bio-security systems are also in place.

Activities & Accomplishments :

- * In each cycle, the unit received 30,000 nos. of SPF PLs of *L. vannamei* from OI, Hawaii after being quarantined for 15 days at AQF, Chennai.
- * Through out the rearing period, animals were fed only with commercially available formulated bio-secure feeds and semi-moist feeds. The water quality is maintained with the help of recirculation unit provided at each section separately. *Chaetoceros* spp. bloom is maintained in the rearing tanks to maintain good water quality and as a water conditioner.

- * Physico-chemical parameters, microbiological studies are also conducted to optimize water quality parameters. To maintain the constant water temperature during the operation of cycle, the temperature is maintained with the help of seawater chillers of different capacity are connected to each section.
- * At the end of a successful cycle, i.e. 6-8 months, the unit provides an average of 15,000/-quality *L.vannamei* broodstock to the CAA approved hatcheries.

Infrastructure Development:

As per suggestions put forth by the Oceanic Institute Expert Team, 2 nos. of Moving Bed Bio-Reactors (MBBR) along with Protein Skimmers were established in the Phase-II rearing sections. These bio-reactors were used to reduce the organic load generated during culture period and to give support to the original Poly- geaserbio - reactors. Surveillance Protocol followed at LvBMC to ensure the SPF Status of the produced brooders:

- * The brooders are screened for the major pathogens viz. WSSV, TSV, YHV, IHNV, IMNV, MBV, BP, HPV, MoV, AHPND/EMS, EHP & NHP through PCR, RT-PCR and H&E Histology.
- * Each lot / cohort is analyzed thrice for the presence of any listed pathogens during each culture period (at 1-2 gm. stage, 15-20 gm. stage & 35-40 gm. stage).
- * A minimum of 60 shrimps per lot per stages are analyzed for the presence of specifically listed pathogens (95% confidence)
- * Non-lethal sampling method is practiced for sample collection.

The screening is conducted either by experts of CAPL-RGCA, Sirkali, CIBA, Chennai or University of Arizona, USA. Histopathological tests are also conducted at least once or twice in a year.

Production Details:

During the period under report, a total of four consignments of SPF *L. Vannamei* Post Larvae / Juveniles comprising of a total of 69,999 PLs / Juveniles were imported for the production of quality SPF *L. vannamei* broodstock at this facility. About 32,030 numbers of SPF *L. vannamei* broodstock were produced and supplied to CAA approved Hatcheries in 48 consignments. The quantity of SPF *L. vannamei* broodstock supplied during each month during 2017-18 is also depicted and graphically represented in the figure.

Evaluation Studies:

Prior to importation of the cohort (batch) for the broodstock rearing, an evaluation study in real farm conditions was conducted with different cohorts obtained from M/s Oceanic Institute, Hawaii, USA. This is done to evaluate the growth performance in Indian Farming conditions. The evaluation studies are being carried out under the supervision of scientific teams of Oceanic Institute, *L. vannamei* BMC and the Central Aquaculture Genetics Lab of RGCA. During the period under report, two such evaluations were done. A total of 5,084 juveniles from Oceanic Institute, Hawaii were stocked in M/s Siri Aqua Farms, Tuni, Andhra Pradesh and cultured for 42 days and attained an average size of 17.5 gms. The baseline data collected was used for selecting families suitable for Indian farming conditions.

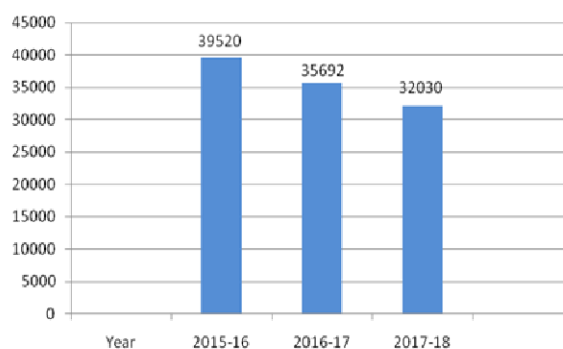


A view of the *P. vannamei* Broodstock Holding Facility of RGCA

S.No	Date	Name of the Hatchery	Numbers
1	16.11.2017	Hybrid EBI Hatchery	400
2	16.11.2017	BMR Marine Products Pvt Ltd	600
3	18.11.2017	Sai Marine Exports Pvt Ltd	500
4	19.11.2017	CP.Aquaculture India Pvt Ltd, Unit-1	800
5	20.11.2017	CP.Aquaculture India Pvt Ltd, Unit-II	800
6	21.11.2017	West coast frozen food Pvt Ltd	800
7	22.11.2017	CP.Aquaculture India Pvt Ltd, Kesupalem	800
8	24.11.2017	C.P.Aquaculture india Pvt Ltd, Vakadu	800
9	26.11.2017	C.P.Aquaculture india Pvt Ltd, Gudur	800
10	28.11.2017	C.P.Aquaculture india Pvt Ltd, Marakkanm	800
11	30.11.2017	BMR Industries Pvt Ltd	600
12	30.11.2017	BMR Industries Pvt Ltd	400
13	30.11.2017	Aqua wave Biotech Pvt Ltd	400
14	03.12.2017	CP.Aquaculture India Pvt Ltd	800
15	04.12.2017	Vaisakhi Bio Resoures Pvt Ltd	1000
16	05.12.2017	MS Hatcheries Pvt Ltd	400
17	06.12.2017	Sri surya hatcheries	1200
18	07.12.2017	KKR Aquatices	900
19	08.12.2017	Hybrid ebi hatcheries Pvt Ltd	800
20	08.12.2017	Crystal aqua marine hatcheries Pvt Ltd	200
21	10.12.2017	Aqua wave biotech Pvt Ltd	400
22	15.12.2017	Gaayathri bio marine	800
23	17.12.2017	Seven seas aqua farms & Exports Ltd	600
24	20.12.2017	Seven seas aqua farms & Exports Ltd	10
25	04.02.2018	KKR Aquatics	900

S.No	Date	Name of the Hatchery	Numbers
26	05.02.2018	East coast hatcheries	400
27	05.02.2018	Alpha Hatchery	600
28	06.02.2018	Seven staar aqua tech	400
29	07.02.2018	Jay Jay Marine	500
30	07.02.2018	Sri Sai Hatchery & Prawn culture Pvt Ltd	500
31	08.02.2018	Sharat industries ltd	600
32	09.02.2018	Vaisakhi Bio-Marine Pvt Ltd	700
33	09.02.2018	Sri kamakshi Hatcheries	900
34	11.02.2018	Gaayathri Bio Marine	1800
35	12.02.2018	Sri Jagannath Hatchery	1000
36	12.02.2018	Anjaneya Hatchery	360
37	18.02.2018	Hybrid EBI Hatcheries Pvt Ltd	1000
38	19.02.2018	Krishna Hatcheries	600
39	21.02.2018	BMR Marine Products Pvt Ltd	1000
40	21.02.2018	Sri Balaji Hatchery	600
41	22.02.2018	Ramanaiah Hatchery	800
42	26.02.2018	Aqua Wave biotech Pvt Ltd	600
43	26.02.2018	Ananya Aqua Products Pvt Ltd	360
44	27.02.2018	Rama Shrimp Centre	800
45	28.02.2018	Sharat industries Ltd	600
46	03.03.2018	Mahitha Shrimp Hatcheries	200
47	03.03.2018	SS hatcheries	600
TOTAL			32030

	Number of Broodstock Distributed (Pairs)	(Nos)
April'17	NIL	NIL
May'17	NIL	NIL
June'17	NIL	NIL
July'17	NIL	NIL
Aug'17	NIL	NIL
Sept'17	NIL	NIL
Oct'17	NIL	NIL
Nov'17	4250	8500
Dec'17	3555	7110
Jan'18	NIL	NIL
Feb'18	7510	15020
Mar'18	700	1400
	16,015	32,030



Quantity of *L. vannamei* broodstock supplied (in nos.)

Month-wise Broodstock Distribution details 2017-18



Rearing Tanks at Phase - 2 of the LvBMC facility



Tilapia Project

Project Location : Manikonda, Krishna District, Andhra Pradesh

Year of Commencement : 2008

Scope of the project:

This project is focussed to propagate the importance of species diversified aquaculture and also to develop and disseminate technologies on breeding, all-male seed production and grow out farming of tilapia. The Project facility consists of a Genetic Nucleus Breeding Centre of GIFT strain (one of the most successful and popular strains of Tilapia for Aquaculture in the world established in technical collaboration with World Fish, Malaysia). The project runs a fully pedigreed selective breeding programme that can support emerging Satellite Breeding Centres and hatcheries across the country through supply of selectively bred high quality germ-plasm. In addition to the supply of broodstock and all male seeds of tilapia, the project also imparts training and offer consultancy services for Tilapia aquaculture.

Description of the Facility:

Major components of the facility are a 12.7 acre farm, comprising of 20 ponds (10 each of 300 sq.m. water spread area and 2,600 sq.m. WSA respectively), with a reservoir for water storage and conditioning. An effluent treatment pond where water is held for sedimentation before discharge is also present. In addition to these, the farm has a breeding unit housed with incubation jars and a

separate all-male seed production unit comprising of 14 nos. of 2 MT tanks.

Activities and Accomplishments:

1. Selective breeding programme:

Rearing of 158 nos. of the sixth generation families were maintained and listed the selected families for tagging. Released the tagged 6,145 nos. of fish representing from 90 unique G6 families was performed after recording the morpho - metric parameters. The fishes were subsequently stocked in duplicate, in 2 nos. of each 2,600 sq.m. sized pond namely YG1 and GG1 with a final stocking density of 1.18 fish/sq.m. The fishes were then allowed to grow in a communal rearing pond until the attainment of broodstock stage.

The 6th generation tagged fish were stocked in conditional hapas @ 120 nos of fish per hapa in GG3 pond after harvesting from communal rearing - GG1 and YG1 ponds. The animals were conditioned for a period of 10 days for morpho - metric data collection. The morpho - metric data of all the individual animals were performed and the data was compiled for the preparation of mating list for the production of the 7th generation. The details of the morpho - metric data is summarized in the table below.

Pond	No. of fish stocked	No. of hapas	No . of fish subjected to Morphometric measurements	Total
GG1	3,072	14	1,399	3 033
YG1	3,073	15	1,634	

The collected morpho - metric data of the 3,033 individual fishes were submitted to the World Fish for mate list preparation. A mate list with 88 families for the preparation of improved 7th generation was received from World Fish. The list comprised of 57 families from the first and 31 families from second batch of the imported fish. A total of 528 fishes representing 3 pairs of replication from 88 nos. of families were selected for the production of next improved 7th generation.

2. Broodstock for Commercial Supply:

Two sets of cohorts with good performing families from the 6th generation families were identified to meet the broodstock demand of the permitted hatcheries. The details of Cohort are tabulated below:

COHORT –SET I

Cohort A	FAMILIES	71	88	140	86	105	12	83	7 FAMILIES
	NO OF FISH	100	100	100	100	100	100	100	700 NOS
Cohort B	FAMILIES	112	53	14	13	125	6	79	7 FAMILIES
	NO OF FISH	100	100	100	100	100	100	100	700 NOS
Cohort C	FAMILIES	150	158	36	2	55	26	7	7 FAMILIES
	NO OF FISH	100	100	100	100	100	100	100	700 NOS
Cohort D	FAMILIES	143	50	64	152	103	80	39	7 FAMILIES
	NO OF FISH	100	100	47	100	49	53	100	549 NOS
28 FAMILIES				2649 FISH					

COHORT- SET II

Cohort A	FAMILIES	6 FAMILIES
	NO OF FISH	1810 NOS
Cohort B	FAMILIES	7 FAMILIES
	NO OF FISH	1946 NOS
Cohort C	FAMILIES	6 FAMILIES
	NO OF FISH	1558 NOS
Cohort D	FAMILIES	3 FAMILIES
	NO OF FISH	710 NOS
4 COHORTS	22 FAMILIES	6,024 Fish

3. Supply of Germplasm to M/s. Savara Bio - Tecnovations, Madurai, Tamil Nadu:

Tilapia project has supplied 1,000 nos. of GIFT Broodstock fingerlings from the 6th generation communally maintained stocks during January 2018. These stocks were successfully transported

from RGCA Manikonda Farm to Madurai with 100% survivals.

4. All - male GIFT Seed Production:

During the review period, 35 batches of egg collection were performed.

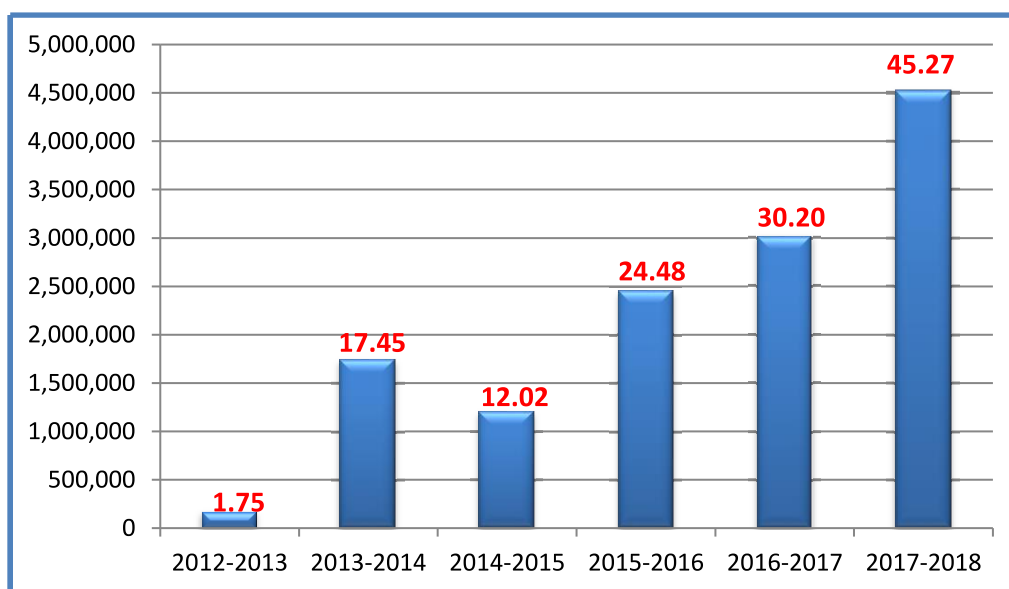
Month	Batches (nos.)	Qty. of collected eggs (nos.)	Qty. of hatched eggs (nos.)	Hatchability (%)
April-17	2	540216	165000	30.5
May-17	0	0	0	0
June-17	0	0	0	0
July-17	3	367830	79000	21.4
August-17	4	944506	173000	18.3
September-17	4	1163750	214000	18.39
October-17	4	1797250	232000	12.9
November-17	4	3171000	882000	27.8
December 17	4	3935750	1597000	40.5
January-18	5	5568500	2385000	42.8
February-18	4	5573750	2438000	43.7
March-18	4	5167750	1970000	38.12
TOTAL	38	28230302	10135000	35.9

5. Supply and sales of all male GIFT seeds:

A total of 45,27,848 nos. of all male GIFT tilapia seeds were supplied in 77 consignments to ICAR Institutes, Research

and Educational organizations and licensed farmers all over India.

Sl. No	Category	Qty. Supplied (nos.)
1	Farmers	7,83,500
2	NGOs	1,55,000
3	Private Companies	17,32,599
4	ICAR Institutes(CIFE,CMFRI)	7,500
5	State Fisheries Departments (TRIPURA, KERALA, ODISHA, WEST BENGAL)	14,50,000
6	Universities & Research Institutes	10,424
7	Others (MPEDA Units)	3,88,825
TOTAL		45,27,848



6. Technology Transfer:

The technology programme transferred to the Tamil Nadu State Fisheries, Krishnagiri was reviewed regularly to collect the feed back on all male seeds production and supply status.



Marine Finfish Hatchery Project

Project Location : Pozhiyoor, Thiruvananthapuram, Kerala

Year of Commencement : 2008

Scope of the Project:

Enhancement of Aquaculture production of the Nation through species diversification

- **Seed production and farming** of high valued export oriented marine fin fishes such as Cobia, Silver Pompano, Mangrove Red Snapper, Giant Trevally, Tomato Spotted Grouper etc. (Breeding technology of Cobia and Silver Pompano has been standardized.)
- **Demonstration of nursery and grow out farming** in inshore and offshore sea cages.
- **Technology transfer** of seed production and farming.
- **Development of supporting systems to improve and sustain the already developed technologies** in the country that can be translated into aquaculture production for export.
- **Stock enhancement** of marine fin fishes.

Programme. The timeline of the project is as follows:

- 2011 - Cobia Breeding Programme initiated
- 2016 - Silver Pompano Breeding Programme initiated
- 2017 - Success in Red Snapper Breeding
- 2018 - Commercial Production of the above species

Currently, the project is in full operation with commercial production of Silver Pompano and Cobia Breeding Programmes and associated R&D activities including domestication and breeding of Malabar Red Snapper, Giant Trevally, Tomato Grouper etc. The sea cage farm also equipped with additional marine cages and stock intended to attain an annual production of 42 MT of Cobia and 12 MT of Silver Pompano.

Description of the facility:

The project facility includes a Marine Fin Fish Hatchery at Pozhiyoor, Trivandrum located in Kerala and the Sea Cage Farm at Muttom, Kanyakumari District, in Tamil Nadu. The project was initiated in 2009, as part of the Eleventh Plan

3. ACTIVITIES AND ACCOMPLISHMENTS:

The major achievement of the project on production and sale of seeds as well as culturing them to harvest size through sea cage farming during the review period are as follows:

Sale of Seeds from Hatchery					
COBIA			POMPANO		
Financial Year	Quantity Nos.	Amount Rs.	Financial Year	Quantity Nos.	Amount Rs.
2017 -18	3266	10 1305.00	2017 -18	195539	1845535.00
TOTAL	598920	3119499.00	TOTAL	277172	2420034.00

POMPANO		COBIA
YEAR	Quantity (In Kg)	Quantity (In Kg)
2017 -18	1678	6148.00

Breeding, Seed production and supply of Cobia (*Rachycentron canadum*) fingerlings:

A total of 9 spawnings were obtained from 13 breeding attempts during the period under review. The total quantity of eggs yielded was 12.46 million. Out of these, 2.05 million of fertilized eggs were directly stocked in larval rearing tanks. Around 15,861 fingerlings in the size range of 6.5 to 8 cm total length were obtained from 3 batches. The project supplied around 2960 nos. of Cobia fingerlings to farmers for aquaculture production and ADAK, Kerala for their culture demonstrations.

Seed production and supply of Pompano (*Trachinotus blochii*):

The pompano underwent seven Volatile/ Natural spawnings and yielded a total of 5.96 million eggs. Out of these, 4.75 millions of fertilized eggs were directly stocked in larval rearing tanks. Around 1,22,351 fingerlings in the size range of 1.2-3 cms., total length were obtained from three batches. During the review period, around 95,069 Pompano fingerlings were supplied to farmers, ADAK, Kerala, University and Demo. Farm of MPEDA RC, Kochi, FFDA, Trivandrum, CMFRI, Vizhinjam, Mandapam, Kochi and for their culture demonstrations. Apart from this, 1 lakh nos. of 1dph hatchlings were supplied to CMFRI, Vizhinjam, Kerala.

Marine finfish rearing in sea cage farms at Muttom:

- a. **Cobia:** A total of 4,555 cobia juveniles of size range 18 -29 cm. and 25 -800 gm. body weight were stocked in cages in Sea cage farm at Muttom. About 6.1 MT. of market sized Cobia were harvested during the period. From this quantity, about 100 kgs. of cobia fish were exported to European Union through M/s Jude Food Exports, Kanyakumari, Tamil Nadu.
- b. **Pompano:** A total of 16,227 Pompano juveniles of size range, 16-142 gm body weight were stocked in Sea cage Farm at Muttom. About 1.67 MT of market sized Pompano was harvested during this period.
- c. **Blue Fin Trevally, Red Snapper and Tomato Grouper:**
Wild caught juveniles of the blue fin trevally and snappers were maintained and reared to brood stock size.

Broodstock Development

About 14 nos. of red snappers of size range of 60 -70 cm and body weight, 4-5.5 kgs are being maintained in the hatchery facility as brooders. In

addition, around twelve numbers of red snapper juveniles are maintained in Sea Cage Farm at Muttom.

3. INFRASTRUCTURE DEVELOPMENT

1. **New multi-level sea water treatment system comprising of air diffuser, cat-iron exchange filter, cartridge - sand - carbon filters has been installed.**
2. **Additional HDPE cage rafts :** Towed and moored 25 nos. (5m X 5m square) of re-fabricated HDPE cage rafts (which were shifted from RGCA's Tilapia's Demonstration Project, Kandaleru) to near the existing Sea Cage Demo.Farm at Jeppiar Fishing Harbour at Muttom, Kanyakumari District, Tamil Nadu .
3. **Fabricated two nos. of PVC work boats** with Taiwan consultancy, M/S Formosa Engineering Co. Ltd.
4. **Construction of new Poly House** - The issue of discontinuous live feed production including algae and rotifers due to high degree of fluctuations in environmental parameter (temperature & photo period) and contamination through seawater aerosols has been successfully addressed by identifying the issues and effectively resolved by installation of UV-IR controlled poly-house. Thus the newly devised system yields a maximum quantity of 40-60 tons. of algae regularly. Production of rotifer biomass in poly - house was also enhanced.
5. The OBM equipped fiber boat in the Sea Cage Farm destroyed during Ockhicyclone was replaced by new one, during the current review period.
6. Additional 5x5 mtr. floating cages and float house transported from Kandalleru was installed in the Sea Cage Farm.
7. The Open sea cages installed at Adimalathurai, Trivandrum was dismantled and transported to BMC, Rajakkamangalam.

5. MAJOR ACHIEVEMENTS:

Marine Finfish Hatchery Project: Issue Identification and Rectification:

1. **The water quality issue** in the hatchery identified to be below allowable limits of dissolved iron which cause larval mortality due to gill chocking during metamorphosis and high bicarbonate content. This resulted in shooting up of pH upto 9.8. The water quality issues was resolved by developing new water treatment procedures using multi-stage water

filtration system and re-locating air blowers to adequately ventilated space. Now the hatchery produces 120 tons of good quality sea water per day.

2. Failure in breeding trials of Cobia:

The lack of successful spawnings in cobia was identified. The various reasons for the failure were use of aged and spent brooders, improper conditioning, nutrition and maturation of broodstock, inadequate hormone dosages for induction etc. The issues were addressed by recruiting new brooders providing proper nutrition and maturation in adequate photoperiod, standardizing new hormonal dosage for induction etc. The hatchery re-started seed production of cobia after a gap of 1 year.

3. Addressing the live feed production issues:

The live feed production was also challenged due to contamination through aerosols, highly fluctuating photo-thermal factors in climate etc. This was rectified by constructing a new poly-house.

4. Sudden mortality of Cobia broodstock and Pompano fingerlings:

The sudden mortality issues of the brooders were identified as Amyloodinium infestation, which was instantly addressed by isolation of the infected brooders and disinfection of hatchery. Therapeutic treatment was administered using hydrogen peroxide and copper sulphate. The issue resided within a span of 7 days.

5. The infestation in cobia broodstock:

Resulted in lack of appetite, ulceration of mouth and lock jaw. The agent was suspected

to be flexibacteria and clostridium. The fishes were isolated and maintained in UV treated water and dosages of garlic juice was administered.

Grow-out farming and harvests from Sea Cage farm, Muttom.

Issues and rectifications:

1. Recurring mortality rates in Broodstock after Cannulation biopsy and Hormonal induction:

The above issue stems out when two dosages of injections of HCG and LHRH are administered, in one induction attempt. This is addressed by implementing new induction protocol of HCG by inducing the brooders only after shifting to hatchery.

2. Inadequate growth of broodstock:

The issue has been identified as lack of sufficient nutrition in terms of feed which was rectified by providing regular supply of trash fish and feeding the animal ad-libitum. This resulted in better growth of broodstock and recruitment for induction

Impacts of the cyclonic storm `Ockhi` on MFHP

MFHP Facility at Pozhiyoor was affected due to `Ockhi` severe cyclonic storm on 30.11.2017. Heavy damages in roofing sheets (transparent and plastic) of all sections except Pompano broodstock section occurred. Power supply was affected in the coastal regions. Strong winds pulled down electric poles. Despite this natural calamity, the project successfully reared the first batch of Cobia fingerlings after a period of one year.



Grouper Project

Project Location : Sea Cage Farm at Rutland Island,
South Andaman

Year of Commencement : 2006

Scope of the Project:

There is an excellent potential for grouper aquaculture in Andaman and Nicobar Islands as there is availability of good quality grouper broodstock in Andaman waters. The presence of many protected bays makes the island further suitable for small scale cage culture of grouper. The sea around Andaman & Nicobar Islands is with stable water quality throughout the year with negligible fluctuations in salinity, temperature, pH and alkalinity. Pollution due to industrial discharges and agricultural activities are also minimal. The area is in close proximity to the major market of live Grouper in the world. Once the logistics for transport of live grouper are made available in the area, Andaman is likely to become the hub of Grouper Aquaculture in India. Live transport can be done through the air or sea route. Once established in terms of technology development and marketing logistics and channels, Grouper Aquaculture in the Andamans will become a major source of income to the fishermen and small and large scale entrepreneurs in the area.

OBJECTIVES OF RGCA GROUPEER PROJECT:

- To develop technology for hatchery seed production of different species of groupers.
- To develop demonstration of grouper nursery technology in floating net cages, grow out culture of groupers in floating net cages to marketable size using better management practices and to transfer the developed technology to the local fishermen, entrepreneurs, self-help groups to develop grouper aquaculture industry in Andaman Islands.

Description of the facility:

OPEN SEA CAGE FACILITY: Four hundred square meter sea area was taken on lease from Port Management Board, Port Blair to hold and condition the wild caught grouper broodstock and for the grow out culture of groupers in floating net

cages. Four species of grouper broodstock such as tiger grouper (*Epinephelus fuscoguttatus*), Orange spotted grouper (*Epinephelus coioides*), Squaretail coral grouper (*Plectropomus areolatus*), Mouse grouper (*Cromileptis altivelis*) were caught from the wild and held in sea cages (3m x 3m x 3m deep) adjacent to Rutland Island.

Details of the broodstock maintained in the floating net cages are Tiger Grouper *Epinephelus fuscoguttatus* - 85 nos. (Male 14 nos.& Female 71 nos.), Orange Spotted Grouper *Epinephelus coioides* 17 nos. (Male: 4 nos.& Female : 13nos.), Squaretail Coral Grouper *Plectropomus areolatus* - 9 numbers (Male: 3 nos.& Female: 6nos.) and Mouse Grouper *Cromileptis altivelis* 1 no. (Female:1no.).

Activities and accomplishments:

The wild caught grouper broodstock are being maintained in floating net cages. The routine activities of the sea cage station are:

- Fresh water bath treatment is given once in month for all the broodstocks to reduce the external parasite infestation.
- The net cages are changed regularly once in a month in order to make free flow of water and the clogged net cages are taken to the shore for jet washing.
- Skin diving is being done once in fifteen days to check for any damage in the net cages, position of anchors, anchor ropes etc.
- Feed is given every alternative day to satiation. The feed generally consists of frozen mackerel and sardine.

Natural spawning recorded during new moon phase:

Natural spawning of grouper broodstock occurs every new moon period in the floating net cages. The details of spawning events of grouper broodstock are furnished below:

Species - Tiger Grouper	
Sl. No	Spawning Date
1	25 th & 26 th of April 2017
2	25 th & 26 th of May 2017
3	22 nd & 23 rd of June 2017
4	22 nd & 23 rd of July 2017
5	22 nd , 23 rd & 24 th of August 2017
6	19 th & 20 th of September 2017
7	19 th & 20 th of October 2017
8	18 th of November 2017
9	17 th & 18 th of December 2017
10	16 th & 17 th of January 2018
11	15 th & 16 th of February 2018
12	16 th , 17 th & 18 th of March 2018
Orange Spotted Grouper	
1	23 rd June 2017
Squaretail Coral Grouper	
1	24 th August 2017

F1 Generation of Tiger Grouper Broodstock:

There are 37 numbers of F1 generation tiger grouper broodstock raised from hatchery

produced fingerlings. The average weight is 4 kg. The wild caught grouper broodstock are being maintained in good condition.



Grading of tiger grouper



Aquatic Quarantine Facility for *L. vannamei* (AQF)

Project Location : Neelankarai, Chennai, Tamil Nadu

Year of Commencement : 2009

Scope of the Project

The project facilitates quarantine of imported *P. vannamei* brooders and ensures the Specific Pathogen Free (SPF) status of the imported broodstock. SPF status is ensured for the absence of the seven OIE listed pathogens (*White Spot Syndrome Virus (WSSV)*, *Infectious Hypodermal Haematopoietic Necrotic Virus (IHHNV)*, *Necrotizing Hepatopancreatic Proteo Bacterium (NHBPB)*, *Yellow Head Virus/Gill Associated Virus (YHV/GAV)*, *Taura Syndrome Virus (TSV)*, *Infectious Myonecrosis Virus (IMNV)* and *Acute Hepatopancreatic Necrotic Disease/Early Mortality Syndrome (AHPND/EMS)* in the imported brooders, through the stringent disease screening protocols, followed at AQF.

Description of the facility:

The Aquatic Quarantine Facility (AQF) is a state -of -the art centralized quarantine centre created and operated by RGCA. It has a fully-fledged quarantine infrastructure of 20 quarantine cubicles, 15 receiving areas and 5 packing sections. The three phases of the facility (Phase-I, II

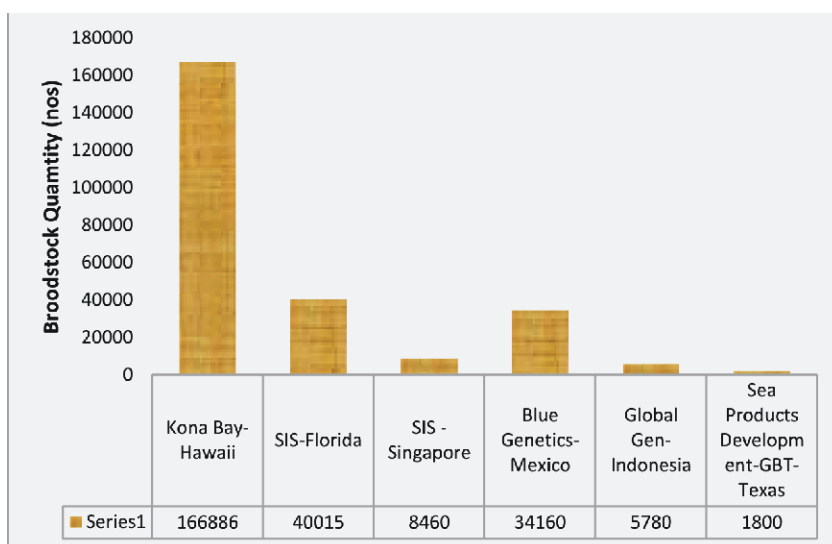
& III) housed in separate modules helps to render year round quarantine services to the industry, without slackening bio - security as phase wise shut down is followed for disinfection and maintenance.

AQF also has a well-established quarantine unit for imported *P. vannamei* post larvae. The quarantine space reservation of the facility is done through a dedicated software system, the Aquatic Quarantine Monitoring System (AQMS) hosted in the organization's web portal.

Activities & Accomplishments:

a. Broodstock quarantine: The current period registered broodstock import of 359 batches of SPF *P. vannamei* consignments. The total quantity of brooders imported were 2,57,101nos, comprising of 1,28,497 male and 1,28,604 female brooders. The overall quarantine survival achieved for the 359 batches was 92.8 % in terms of live brooders received.

The brooders were received from 6 Broodstock Centres, viz. Shrimp Improvement Systems



(SIS), Florida, SIS, Singapore, Global Gen, Indonesia, Blue Genetics, Mexico and Sea Products, Texas. The quantity of stock received from various suppliers are as depicted in the graph below.

The facility also registered quarantine occupancy of 82 %, during the period 2017-18. The total number of quarantine cycles accomplished by the facility was 538, of which, 288 were normal and 250 were of the premium type. Normal cubicles can accommodate a maximum of 16 kg biomass and premium or high density cubicles accommodate 25 Kg biomass.

All the samples screened from the imported 359 batches were ensured as SPF stock.

Quarantine of Parent Post - larvae:

The current review period recorded import of 8 batches of *P. vannamei* post - larvae by RGCA

from M/s Oceanic Institute, Hawaii.

The total larvae imported was 95047 nos. The overall mean survival of the larvae during the 15 days quarantine period was observed as 94.9%.

Up-gradation of the Aquatic Quarantine Monitoring System Software:

The facility also upgraded the online quarantine space reservation system to serve the hatchery operators in a more user friendly manner. Provision of emergency quarantine cubicles were also implemented in the online. User friendly features such as SMS and email alerts are sent to all AQMS registered hatcheries on cancellation of any cubicle online. This would notify all hatcheries on the availability of a vacant slot in the quarantine. Similarly the terms and conditions of the AQMS were also modified so as to encourage all CAA registered hatcheries to avail the services of AQF.

A consignment being received in Prequarantine area



Technology Transfer Training & Administrative Complex





Technology Transfer Training Division

Technology Transfer Training Division

The TTTAC plays a pivotal role in showcasing the research activities of RGCA to the aquaculture sector through its active participation in trade shows, fairs and expositions. The trademark of TTTAC is its customised trainings, awareness, outreach programmes conducted regularly on various aspects of aquaculture for the benefit of the

industry. The unit is also involved in collection of feedback data from hatcheries, farmers and research organizations that regularly utilizes the services of RGCA in the form of seeds, feed and consultancy services.

The training programmes conducted by TTTAC during the period under review were:

Training Programmes

Best Husbandry Practices in Asian Seabass culture:

TTTAC recorded six training programmes on Best Husbandry Practices in Asian Seabass Aquaculture, in which, 77 beneficiaries participated. One training programme on Seabass Culture was organized exclusively for the benefit of Officials from the Dept. of Fisheries, Kerala and five other training programmes for the benefit of farmers, entrepreneurs, technicians, consultants and students from various parts of the country. A total of 77 participants were benefitted from these programmes. The participants expressed keen interest to initiate Seabass Aquaculture in their respective States using seeds produced from RGCA Hatchery. After completion of the programme, twenty trainees procured Seabass fry from the RGCA Hatchery for trial farming.



Grading of Seabass fry by trainees and explaining about the site during the training programme

Mangrove Crab Aquaculture

A total of nine training programmes were conducted on Mangrove crab Aquaculture during the period under review. Out of these, nine programmes were exclusively conducted for the benefit of farmers, entrepreneurs, technicians,

consultants and students from various parts of the Country. A total of 113 participants benefitted from these programmes. After completion of the programme, about fifty thousand seeds were supplied to the trainees for trial farming.



Farmers & entrepreneurs involved in harvesting and grading of crab lets



A session of the training programme on GIFT Breeding and Seed Production in progress



Breeding, seed production and Grow-out farming of GIFT

During the period under report, seven training programmes were conducted on **Breeding, Seed Production and Grow-out Farming of Genetically Improved Farmed Tilapia (GIFT)**. Out of which, one

programme was exclusively for Officers from the Dept. of Fisheries, Kerala. Another set of training programmes were also conducted for the benefit of 70 participants comprising of entrepreneurs, farmers, consultants, academicians from various part of the Country.



Distribution of training materials

Live feed production for Marine Finfish Hatchery operation :

Student oriented training programmes on Live Feed Production was conducted by TTAC during the period under report. The sessions included culture techniques of different kinds of

phytoplankton (unicellular diatoms such as *Chaetoceros*, *Chlorella*, *Nannochloropsis* and *Tetraselmis*) and zooplankton mainly the rotifer varieties *Brachionus plicatilis* and *Brachionus rotundiformis*, copepods, and *Artemia*.



Officials from the Dept. Of fisheries & Students involved in a practical session on Live Feed Production training programme

Training Programmes on Aquaculture Pathology:

Hands on training programme on Aquaculture Pathology was organized by RGCA at its Technology Transfer Training and Administrative Complex at Sirkali exclusively for the benefit of 10 Officers from the Department of Fisheries, Kerala, 19 Officers from the Department of Fisheries,

NaCSA, Andhra Pradesh. This was organized as a part of the Capacity Building Exercise initiated by MPEDA and 60 others like Students, Aquaculture Stakeholders, Research Scholar and Teaching Staff etc., for implementing its vision for the development of Aquaculture in various States of India.

Hands on training programme on Aquaculture Genetics was organized by RGCA at its Technology Transfer Training and Administrative Complex at Sirkali, exclusively for the benefit of 37 Students, Aquaculture Stakeholders, Research Scholar and Teaching Staff etc., for implementing Genetic in Aquaculture.

The programme provided a detailed overview on shrimp diseases and their prevalence in India, emerging diseases across the world, molecular techniques in disease diagnosis, "Good Laboratory Practices", histological methods in disease diagnosis etc. Presentations were given in this regard on 'Viral Strains / Genotypes relevance in diagnosis and disease severity', highlighting the importance of virulent strains in pathogenesis, bacterial disease diagnosis and management.

Presentations stressed on the use of probiotics in *Vibrio* control rather than through antibiotics. The impact of inbreeding and disease susceptibility in aquaculture as well as population structure analysis using molecular markers were also discussed.

An interactive practical session was the most unique aspect of this training through which the participants obtained hands on experience in DNA extraction, amplification by PCR, Gel electrophoresis and interpretation of results for diagnosis of emerging shrimp disease caused by *Enterocytozoon hepatopenaei* (EHP). Sessions on WSSV diagnosis and sensitization on basic histological techniques were also a part of the training.



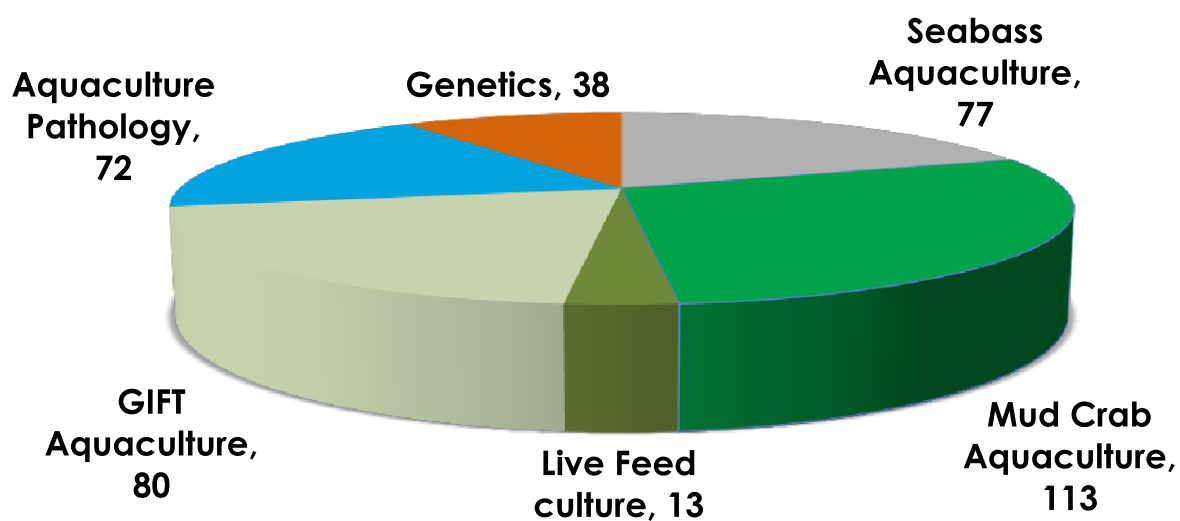
Trainees attending a Practical Session on Histology and PCR



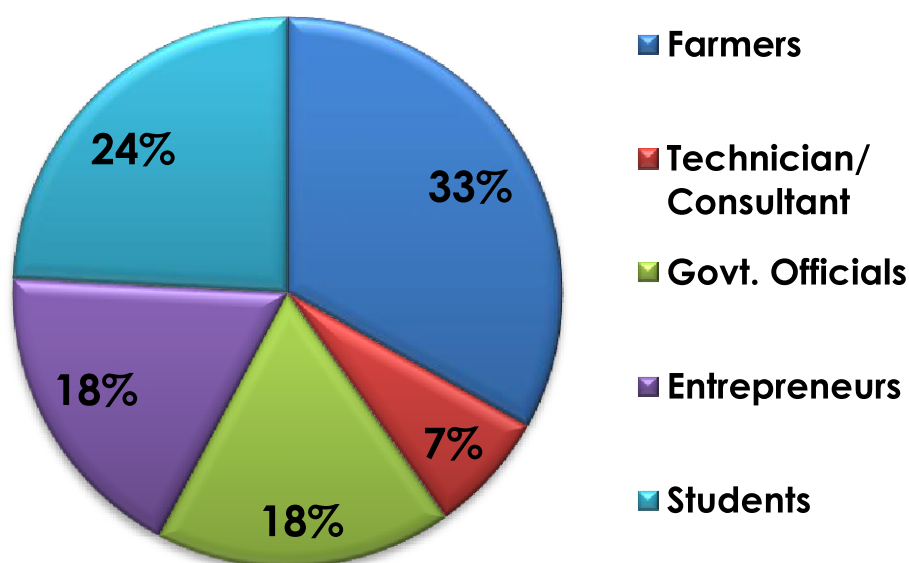
Trainees attending practical session on Genetics



Participants at the training programme on Shrimp disease and diagnosis



Training programmes conducted by TTTAC during 2017-18

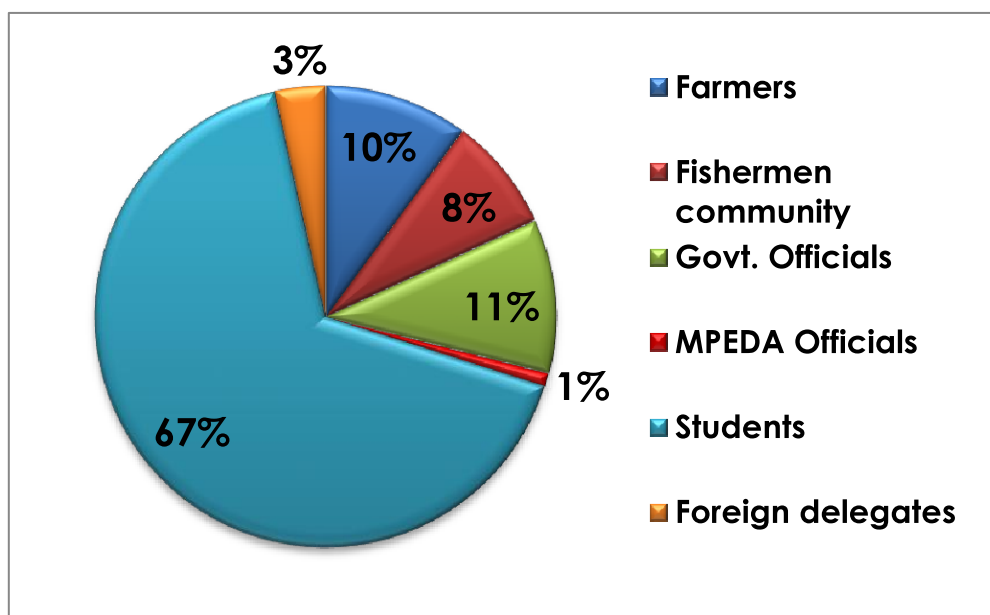


Beneficiaries of the training programmes conducted by TTTAC during 2017-18

Familiarization Programmes:

Fifty one familiarization programmes on the "Latest Trends in Aquaculture Practices of Cobia, GIFT, Seabass and Mud Crab Aquaculture as well as on all new R & D activities carried out by RGCA" were

conducted by the TTTAC. About 1,464 participants comprising of Students, Staff, Govt. Officials, Fisher folk, Self Help Groups and Farmers benefitted through these programmes.



Awareness programmes conducted by the TTTAC

Training Programme	2015-16		2016-17		2017-18		Total Programmes conducted	
	No. of trainin g	No. of Beneficarie s	No. of Trainin g	No. of Beneficarie s	No. of trainin g	No. of Beneficarie s	No. of Training	No. of Beneficarie s
Seabass Aquaculture	6	87	8	106	6	77	25	327
Mud Crab Aquaculture	11	137	10	181	9	113	48	663
Live Feed	1	8	1	16	1	13	4	47
GIFT Aquaculture	11	154	6	86	7	80	31	382
Cobia	1	25					1	25
Artemia	2	40					2	40
Aquaculture of GIFT in Cage	1	23					1	23
Pathology training	1	20			4	72	5	92
Genetics (AMMFA)			1	23	2	38	3	61

Year wise comparison details of the training programmes conducted by TTTAC



Central Aquaculture Genetics Laboratory

Objective of the Project:

Central Aquaculture Genetics Laboratory (CAGL) plays a pivotal role in selective breeding programme of various RGCA projects. The Genetics Lab undertakes population genetic studies for targeted species to determine founder population for selective breeding programme using molecular markers and multiple molecular markers to resolve taxonomic ambiguity as well as seafood fraud issues.

Description of the Facility:

The Lab is the first and only Aquaculture Genetics facility accredited by National Accreditation Board for Testing and Calibration Laboratories (NABL) as per ISO/IEC: 17025:2005. The lab is equipped with new generation equipments like automated DNA extractor, automated electrophoresis unit, automated Genetic Analyzer (ABI 3500) to perform qualitative and quantitative genetic studies.

Activities during 2017-18:

A total of 387 tissue samples from RGCA Projects and various Research Institute / Universities were received for species identification and genetic studies during the period. A total of 3,208 PCR Tests were performed for the amplification of Mitochondrial DNA regions, Nuclear DNA regions and other Gene specific DNA fragments. During the period, 599 samples were sequenced at CAGL Facility.

Evaluation Stream (ES) trial farming of *L. vannamei*:

A growth trial farming was performed for Oceanic Institute shrimp seeds under the evaluation stream (ES) studies of *L. vannamei* (ES-12 &13) at M/s Vaisakhi Bio-Marine Farm in Tuni, Andhra Pradesh during June 2017 to September 2017. The growth evaluation studies of the two batches of seeds ES-12 and ES-13 harvested shrimps were also completed during the current review period.

Major Achievements

- Ø Re-assessment of CAGL has been successfully completed on 17th & 18th June 2017 by experts from NABL, which is a part of NABL accreditation extension for the next two years (2017- 2019).
- Ø Five students from various colleges of Tamil Nadu successfully completed their 3 months dissertation project thesis work at CAGL.

Publications

- Ø 29 sequences were published in NCBI Gen Bank by CAGL and accession numbers are as follows:
Penaeus monodon (MF563556 - MF563558, MF563563 - MF563565),
Fenneropenaeus indicus (MF563559, MF563566), *Artemia* (MF563560),
Macrobrachium rosenbergii (MF563561, MF563567 - MF563573 and Groupers (MF563562, MF563574 - MF563582, MF978166, MF978167).



The evaluation stream of P. vannamei imported by BMC-L. vannamei project of RGCA, being acclimatised in tanks prior to stocking in farms at Andhra Pradesh,

Central Aquaculture Pathology Laboratory

Central Aquaculture Pathology Laboratory (CAPL)

The Central Aquaculture Pathology Laboratory (CAPL) provides disease diagnostic and pathogen surveillance services to various Projects of RGCA, Hatcheries, Aquaculture Farmers, Seafood Exporters and Researchers. The Laboratory renders regular service for screening economically significant Pathogens present in commercially valuable Shellfish and Finfish. Currently, the lab screens for a total of 21 Pathogens (17 Shrimp Pathogens, 1 Freshwater Prawn Pathogen, 3 Marine Finfish Pathogens).

Objective:

- * MPEDA/RGCA established Central Aquaculture Pathology Laboratory (CAPL) at Sirkali, Tamil Nadu in 2011 to cater the disease diagnostic and disease research needs of the Aquaculture Industry.
- * RGCA Central Aquaculture Pathology Laboratory provides disease diagnostic/pathogen surveillance service to RGCA Projects, Hatcheries, Aquaculture Farmers & Seafood Exporters.

Activities:

- * The lab done screening of a total of 21 Pathogens (17 Shrimp Pathogens, 1 Freshwater Prawn Pathogen, 3 Marine Finfish Pathogens)

Laboratory had processed samples & tests as follows:

- o Molecular Pathology Laboratory (PCR Lab) - 988 samples & 10,622 tests
- o Histopathology Laboratory 1160 samples
- o Microbiology 747 samples
- o Water Quality Laboratory 714 samples & 3511 tests

- * **MPEDA / RGCA** is a partner organization in **National Surveillance Programme for Aquatic Animal Diseases (NSPAAD)** coordinated by NBFGR and funded by NFDB since 2013 in Odisha, Tamil Nadu & Andaman and recently got extension up to September 2019.

- * *150 Samples were collected and 900 tests were conducted. Pathogens like WSSV, EHP, AHPND/EMS, IMNV, TSV and YHV were screened for shrimp culture.*

- * *TiLV surveillance was conducted in Tamil Nadu, Kerala, Andhra Pradesh, Odisha & Maharashtra. A total of 53 samples were screened for the presence of TiLV.*

Details of Test Performed during the period April 2017 to March 2018

Month	PCR		Histology	Microbiology	Water Quality	
	Samples	Tests			Samples	Tests
APRIL 2017	19	311	45	82	82	304
MAY 2017	64	639	212	103	101	406
JUNE 2017	27	383	139	61	61	294
JULY 2017	36	705	161	36	34	146
AUGUST 2017	84	1742	168	41	39	228
SEPTEMBER 2017	65	839	23	61	52	286
OCTOBER 2017	70	898	73	102	88	454
November 2017	130	889	114	37	37	198
December 2017	88	829	81	58	60	438
JANUARY 2018	107	1124	71	41	35	205
February 2018	203	1515	45	46	46	254
MARCH 2018	95	748	28	79	79	298
Total	988	10622	1160	747	714	3511



Aquaculture Library

Established in the year 2011, the library provides a wealth of information services and knowledge resources both in digital and print forms to the RGCA staff and as well as its users including aquaculture researchers, industry, academy and other organizations. The library has an impressive collection of books, journals, technical reports and various publications with separate sections for farmed species across the world with special reference to species formed in Asia. It also offers Online Public Access Catalogue (OPAC) via the Institute's web site.

Resources related to various disciplines of aquaculture and fisheries, viz., shrimp and fish

grow-out culture technology, hatchery technology, physiology, nutrition, biotechnology, genetics, pathology, aquaculture engineering, socio-economics and extension are also housed in this library, apart from the rare collection of books in the dedicated section of Dr. E. G. Silas Endowment Library.

The library subscribes 25 international and 12 national journals and provides online access to the literary resources to the scientists and technical officers of RGCA.

The RGCA library also maintains regular exchange services with national and international organizations of mutual interest. Annual reports, Newsletters and Research Publications of RGCA are being sent to various Research Organizations, Universities and Aquaculture Industries and the library also receives similar publications from them.

During the current review period, the library added 137 new books and 37 journals to its existing collection.

View of the Aquaculture Library





Infrastructure Development

The Technology Transfer and Training Centre at the Rajiv Gandhi Centre for Aquaculture (RGCA), is provided with a power load of 103 KVA from the TNEB. During Technology Transfer Trainings, Seminars, Summits and peak hours, it has been noticed that power demand was about 120 KVA. Therefore, steps were taken to upgrade LT to HT. The total electrical power requirement was estimated to 200 KVA for a total amount of Rs.138 lakhs.

The Estimate was placed in 55th EC (EC 55.03 V.8) meeting held on 29th March 2017 and obtained approval to upgrade the Electricity supply from LT to HT at RGCA - TTTAC, HQ, Sirkali.

Accordingly, tenders were invited for the required work. Among the nine tenders received, M/s.Safvolt Switch Gears private Limited, Coimbatore was selected as L1 contractor with a tender value of Rs.55,82,708/- and up gradation of LT to HT was done

View of LT to HT Transformer





Awards & Recognitions

RGCA recognized as an Accredited Research Centre for Doctoral Degree in Marine Sciences

RGCA gained accreditation as the Research Centre for pursuing Doctoral Degree in Marine Sciences from Bharthidasan University, Tiruchirapalli, Tamil Nadu, during the current review period. The Institute in collaboration with the University is all set to provide a fillip to the aquaculture technology and skill development in the fisheries sector. The commendable achievements made by RGCA in the field of aquaculture development and the rapid strides taken by the organization in the field of commercially oriented research has paved the way for obtaining accreditation. Other

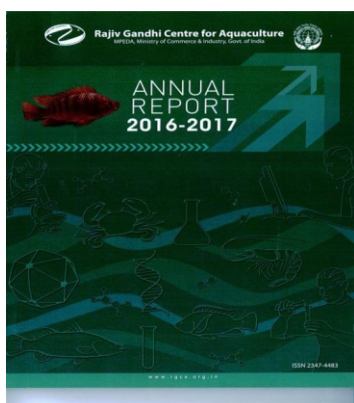
programmes such as faculty exchange, students training / internship and collaborative research programmes with the University also is in the pipeline.

NABL accreditation extended

NABL accreditation (ISO/IEC: 17025:2005) was extended to CAGL for another two year period (26/06/2017 to 25/06/2019) by National Accreditation Board for Testing and Calibration Laboratories (NABL) a constituent Board of Quality Control of India.



Publications from the RGCA Team



RGCA 2017. Annual report 2016-17
Rajiv Gandhi Centre for Aquaculture,
Sirkali, Tamil Nadu.

114 Pages; Paperback full colour
ISSN : 2347- 4483



RGCA Newsletter No. 8.
Released during 2017-18



RGCA Newsletter No. 9-10.
Released during 2017-18

- * Remyan, M. C, Daly Cyriac, Krishnakanth Varadaraju, Sruthi Prem, O,C, K Karthick Kannan, Jaideep Kumar and Thampi Sam Raj Y. C. 2017. Haematological parameters as predictive indicators of stress induced mortality in pacific White shrimp *Penaeus Vannamei* (Boone, 1931) broodstock during transboundary shipment. Indian Journal of Geo Marine Science. 46(7), pp 1440-1446.
- * Shanmugaarasu Venkatachalam and Kathiresan Kandasamy 2017. Microbial Probiotics for better fish survival and growth of Asian seabass (*Lates calcarifer*). International Journal Of Fisheries and Aquatic Studies. 5(4): 129-135
- * Shanmugaarasu Venkatachalam, Kathiresan Kandasamy, Ilanchelian Krishnamoorthy c, Rajendran Narayanasamy d 2017. Survival and growth of fish (*Lates calcarifer*) under integrated mangrove aquaculture and open-aquaculture systems. Aquaculture Report, 9. Pp 18-24



Participation in Fairs and Expositions

The current review period witnessed active participation of RGCA in various scientific forums and expositions. These included-

1. AQUA AQUARIA 2017, Mangalore

The 'Make in India' theme pavilion of Rajiv Gandhi Centre for Aquaculture (RGCA) focused on "Diversification in sustainable aquaculture" was the major talking point at the Aqua Aquaria India 2017 Show held at Mangalore, the chief port city of Karnataka, from May 14-16, 2017.

The fourth edition of Aqua Aquaria India (AAI), a biennial and one of the biggest showpiece events in Asia on the aquaculture and ornamental fishery sectors, was organized at Nehru Maidan by the Marine Products Export Development Authority (MPEDA). The important event is a unique platform to showcase the latest developments in sustainable aquaculture and ornamental fish breeding and rearing technology to encourage aquaculture species diversification and magnification in a sustainable manner.

RGCA set up an Individual (30m X 30m) Hangar, depicting the diverse activities of the centre which showcased live finfish such as Seabass, Grouper, Cobia & GIFT Tilapia in large tank enclosures and YY Tilapia, Scampi, Tiger shrimp and Pacific white shrimp. miniature ponds. A working Recirculation Aquaculture System (RAS) that supported all these tanks were also on display. RGCA invited special attention on Mangrove Crab Aquaculture by setting up a model of mangrove crab sanctuary with Mangrove plants and creating a natural environment for the crabs. Culture of Mangrove crabs in pen was also displayed in the crab sanctuary, 12 aquarium tanks were placed for showcasing live Shrimp seed, juveniles, Artemia biomass and finfish fingerlings and juveniles of cobia, snappers, pompano etc were also displayed for the benefit of farmers, delegates, entrepreneurs, who visited the stall. Sea cages used for offshore Sea cage farming were also displayed.

Over 15000 visitors including delegates comprising mostly farmers, aqua culturists, technicians, consultant, retired scientists and entrepreneurs from various parts of India thronged the RGCA Pavilion.



Shri. Pramod Madhwaraj, Hon' Minister
For Fisheries, Sports and Empowerment,
Govt. of Karnataka offering feed to cobia
fish



Dignitaries at a model unit of Aquatic
Quarantine Facility displayed at Aqua Aquaria
2017



Chairman MPEDA/President RGCA
Dr.A.Jayathilak, I.A.S., at the Red Tilapia Fish
pond exhibit



A RAS model displayed at RGCA Pavilion



Crowd thronging in RGCA Pavilion



View of the live model of Mangrove Mudcrab
Sanctuary

2. Global Konkani Festival at Navi Mumbai

The 6th edition of the Global Konkani Festival organized by Konkani Bhumi Pratishthan in association with "Make in India" and MITDC was held at CIDCO Exhibition and Convention Center, Vashi, Navi Mumbai from 6th to 10th Jan., 2018.

Hon'ble Union Minister for Commerce and Industry, Shri. Suresh Prabhu inaugurated the event in presence of dignitaries like Shri. Anant Geete (Union Minister - Heavy Industries), Shri. Jaykumar Rawal (State Minister - Tourism), Shri. Uday Takre and Dr. A. Jayathilak, I.A.S., Chairman, MPEDA / President, RGCA. Extending his support towards Global Konkani Fest, Shri. Suresh Prabhu, in

his inaugural speech, informed that there are huge opportunities available in sectors such as tourism, fishery, agriculture and ports, which would help in further development of Konkani region. He emphasised the importance of the "Make In Konkani" campaign under "Make in India" at the Global Konkani Fest meant for the benefit of youth and entrepreneurs in Konkani region. This can be achieved with the co-operation of various departments, banks and people with expertise in the above said areas, who can give guidance and lead the region to a global level."

Around 3 to 4 lakh people visited the exhibition. Shri. Sanjay Yadavrao, Chief Organizer, Global Konkani

and Chairman & Founder, Konkan Bhumi Pratishthan informed that "the idea behind organizing the 6th Global Konkani Festival is to promote Konkani tourism on global map besides boosting reverse migration and initiate a mega youth entrepreneurship drive in the Konkani region". He further added, "It will provide a platform for self-employment projects at every village in Konkani, in the areas of tourism, modern agriculture, processing, fisheries, forest herbs, port development, etc."

The key attraction of the event was the MPEDA - RGCA pavilion. The pavilion was a unique blend of the 'Make in India' concept while pursuing the idea of "Diversification in Sustainable Aquaculture". Fish

production in cages is receiving more attention today because of the increased per capita consumption of fish, rapid decline of wild fish stocks and comparatively easy management of the culture crop. This is a good alternative to traditional agricultural crops for many small or limited resource farmers. RGCA had successfully demonstrated the cage culture technology for several marine species including cobia, grouper, silver pompano, seabass and tilapia. During the mega event, the technical aspects of cage fabrication and cage farming activities were demonstrated with prototype models. It was one of its kind and participants of the event were highly impressed by the display.



Hon'ble Union Minister for Commerce & Industry, Shri. Suresh Prabhu inaugurating the MPEDA-RGCA Pavilion - "Aqua Bay"-

3. 2. 1st India International Seafood Show (IISS 2018), Goa

RGCA actively participated and showcased its activities through live display of its own hatchery produced fingerlings and farm produced fish and shrimps in the 21st International Seafood Show IISS 2018, held on 27-29 January 2018, jointly organised by the Marine Products Export Development Authority (MPEDA) and the Sea food Exporters Association of India (SEAI) at Fatorda, Margao, Goa. The live exhibits comprised of specimens of fingerlings of Asian Seabass, GIFT tilapia, Cobia, Pompano, adults of SPF Black Tiger shrimp, SPF P.vannamei, Scampi and Green Mangrove Mud Crabs.

The IISS is a biennial and a seafood trade fair event in Asia, and is a common forum where aqua culturists, exporters, processors, feed manufactures and other allied sectors actively participate. The stall of RGCA was not only a visual treat to the visitors but also served as an informative interface to the public through which the need for sustainable and scientific aquaculture was highlighted.

The event was well attended by the aquaculture community of the Country. A total of 166 stalls, represented by exporters and importers of Indian marine products, processors, farmers, aqua culturists, processing machinery manufacturers, and R&D institutes, participated. Around ten thousand people from various parts of India including overseas participants attended the show.



Hon'ble Union Minister for Commerce & Industry interacting with the Chairman, MPEDA / President, RGCA, Dr. A. Jayathilak, I.A.S.



Hon'ble MP, Goa in discussion with MPEDA Secretary, Shri. B. Sreekumar



"Machilipatnam"- the Seafood Stall set up by RGCA:

While the RGCA pavilion was cynosure of all eyes at India International Seafood Show (IISS) 2018, at Goa, "Machilipatnam" a seafood stall set up by RGCA in the venue grounds quietly attracted thousands of seafood lovers who thronged the stall to relish the mouthwatering seafood delicacies served. The runaway success of the stall, first introduced during the previous edition of AQUA AQUARIA in 2013, inspired RGCA to set up the same again with more variety of Seafood.

Delicacies of fish and shrimp in the tastiest Andhra cuisine prepared from fresh farm produce from the R & D farm of RGCA and served at the stall, attracted large crowds throughout the duration of the event. The stall attempted to induce the public to try out new varieties of fish other than the

conventional Carps and Basafish. The menu included a choice of whole plate sized fried Tilapia, Tilapia Kebabs and nuggets made from tilapia fillet, preparations with Seabass and Cobia steak as well as Shrimp. Items of the menu had a typical Indian flavor that appealed equally to the delegates who had come from all across the country. The stall also provided takeaway packs and had a frozen fish counter where all these fish were made available in ½ Kg and 1 Kg frozen packs.

Over 1000 persons relished the seafood served at the stall that was open for two and a half days. RGCA's Machilipatnam as it did during the previous edition of Aqua Aquaria in 2015 made a great impact on the public and would definitely achieve its objectives in popularizing the new varieties of fish, both as a candidate species for farming as well as to make them sought after varieties in the domestic markets



View of "Machilipatnam" stall



Participations in Training Programmes, Seminars and Workshops

S. No	Name of the Staff	Training/seminar	Organized by	Duration
1	Shri. Mathews Varkey	Exhibition on “Vision Jammu & Kashmir 2018”	Department of Tourism Udhampur, J&K,	29 th -31 st January 2018
2	Mr. L. Ruban	6 days short-term training programme on “Quality Management System and Internal Audit ISO/IEC	TANUVAS, Madhavaram	23 - 28 October 2017.
3	Dr. Anandajothi	one day technical session on “The next stage Bioprocessing” at Eppendorf	Training centre, Chennai	31st October 2017
4	Dr. Mithun Raj	Training on Laboratory Quality Management and Internal Audit as per ISO/IEC 17025:2005	Pharmacovigilance laboratory for animal & food safety, Chennai	24– 27 October 2017
5	Mr. B. Babu	Roche Real time machine training on EHP Real time Kit analysis	AQF, Neelankarai	



Participations/ Lectures delivered by RGCA team at various forums

Sl.No	Name of the staff	Conference/Meeting attended	Date	Invited talks/presentations
1	Dr.V.Shanmuga Arasu	Alternative livelihood programme for Fisherfolk/farmers which is organized by Dept. of Fisheries, Krishnagiri, Tamil Nadu	24/10/2017	"Reservoir Management and Cage Culture Activity"
2	Dr.V.Shanmuga Arasu	Alternative diversified species which is organized by MPEDA-RC, Nagapattinam for the benefit of farmers from Trichy region	25/10/2107	"Eco-Friendly and Sustainable Diversified Aquaculture"
3	Dr.V.Shanmuga Arasu	Alternative diversified species which is organized by MPEDA-RC, Nagapattinam for the benefit of fisher folk at Manora, Mallipattinam from Thanjavur region	23/11/2017	"Eco-Friendly and Sustainable Diversified Aquaculture"
4	Dr.V.Shanmuga Arasu	Training programme which is organized by MPEDA-RC, Nagapattinam for the benefit of farmers/ entrepreneurs/ fisher folk at Mettur Dam, Salem District	21/12/2017	"Eco-Friendly and Sustainable Diversified Aquaculture"
5	Dr.V.Shanmuga Arasu	Training programme which is organized by MPEDA-RC, Nagapattinam for the benefit of farmers/ entrepreneurs/ fisher folk at Lalgudi, Tiruchirapalli District	06/02/2018	"Eco-Friendly and Sustainable Diversified Aquaculture"
6	Dr.V.Shanmuga Arasu	Aquaculture Expo 2018, organized by Aqua International, Hyderabad held at Sangamitra Convention Centre, Navarkulam, Pondicherry	22 & 23 February 2018	Invited talk on "Diversified species for sustainable Aquaculture – Seabass & GIFT Tilapia"

7	Dr.V. Shanmuga Arasu	Presentation at Dept. of Animal Husbandry, Karaikudi Alagappa University, Karaikudi for the benefit of Students	06/03/2018	Invited talk on "Diversified species for sustainable Aquaculture – Seabass & Mud Crab Aquaculture"
8	Dr.V. Shanmuga Arasu	Presentation at AVVM Sri Puspam College, Poondi for the benefit of students	13/03/2018	"Diversified species for sustainable Aquaculture and business Opportunities"
9	S.Balachandar	Presentation at Fakir Mohan University, Balasore, Orrisa	21-22 February 2018	Invited talk on "Brain Storming Session on "Nutrition & Live feed for Aquaculture Species"
10	Dr. Annand Kumar	MPEDA, RD, Bhubaneswar	08.03.2018	Invited talk on "BMP on shrimp hatcheries & role of quarantine/BMC in India"
11	Dr. Annand Kumar	NaCSA, Kakinada	24.03.2018	Invited talk on "BMP on shrimp hatcheries & role of quarantine/BMC in India"
12	Geo Christi Eapen	Aquaculture Demonstration farm Ayiramthengu, Kerala	22-02-2018	handled a half a day session for the Officers training programme
13	Mathews Varkey	SSP VPC in association with Regional Division, Kochi MPEDA	18/8/2017	Better management practices and diversification in aquaculture- for quality, food safety, production and sustainability'
14	P.Srinivasa Rao	Department of Fisheries Tamil Nadu	25/10/2017	GIFT Tilapia Aquaculture cage culture practices in reservoirs
15	B.Appala Naidu	SG Siddhartha Degree college, Vijayawada	7/2/2018	Lecture on "Diversification of Aquaculture"
16	P.Srinivasa Rao	MPEDA Regional Centre Bhubaneshwar	21/2/2018	Lecture on "GIFT Tilapia Aquaculture grow out practices"



Visit of Dignitaries

President, RGCA & Chairman MPEDA, Dr. A. Jayathilak, IAS visited the RGCA Tilapia Project at Manikonda, Andhra Pradesh on 11/9/2017.



President RGCA & Chairman MPEDA, Dr. A. Jayathilak, IAS takes a closer look at GIFT and Scampi, reared in RGCA facilities



President RGCA & Chairman MPEDA, Dr. A. Jayathilak, IAS interacts with the staff of hatchery rearing unit



President, RGCA & Chairman MPEDA, Dr. A. Jayathilak, IAS along with the Project Director monitoring feeding activities at Tilapia hatchery



President, RGCA & Chairman MPEDA, Dr. A. Jayathilak, IAS monitoring the Bio-security measures at RGCA Tilapia farm



Grow-out rearing of GIFT explained



Tagging of GIFT being demonstrated



President RGCA & Chairman MPEDA, Dr. A. Jayathilak, IAS being apprised of the protocols followed in the tilapia hatching unit



President RGCA & Chairman MPEDA, Dr. A. Jayathilak, IAS with the Tilapia Project staff



Hon'ble Joint Secretary, MoC & I, Govt. of India Shri. Santosh Sarangi, I.A.S visited DTSP facility on 19/02/2018.



Hon'ble Joint Secretary, Shri. Santosh Sarangi IAS at the Domestication of Tiger Shrimp Project (DTSP) facility



Hon'ble Joint Secretary observing SPF tiger shrimp broodstock



Hon'ble JS at the Nucleus Breeding Centre (NBC) of the Nursery tank



Hon'ble JS interacting with the staffs at the DTSP facility



Nagapattinam District Collector, Shri. S. Suresh Kumar , I.A.S., visited RGCA, HO and its various facilities on 22.09.17



Discussion with Dr. S. Kandan , Project Director RGCA



Nagapattinam District Collector, Shri. S. Suresh Kumar, I.A.S., discussing with RGCA, officials and Department of Fisheries officials at RGCA-HO



Hon'ble Chief Secretary, Andaman & Nicobar Islands, Shri. Anindo Majumdar, I.A.S. visited DTSP and Grouper Sea Cage Facility on 17/03/2018.



Chief Secretary, A & N Islands at the Secondary Quarantine Unit of the DTSP facility



Hon'ble Chief Secretary, A & N Islands at the Grouper Sea cage facility



Chief Secretary, A & N Islands at the Grouper cage site



RGCA Officer interacting with the Hon'ble Chief Secretary, A & N Islands Shri. Anindo Majumdar IAS



Chief Secretary, A & N Islands, Shri. Anindo Majumdar IAS being apprised of the activities at DTSP by the RGCA official



Technical Committee visited RGCA's Broodstock Multiplication Centre for *L. Vannamei*, VISAKHAPATNAM

Broodstock Multiplication Centre for *L. Vannamei* of RGCA at Visakhapatnam, Andhra Pradesh was visited by Shri. Jeff Prochaska, Senior Research Associate, Shri. Mark Renshaw & Shri. Scott Nagua of OI have visited India. Shri. Mark Renshaw have visited Demo pond for ES 12-13 stocking. Shri. Jeff, OI and Dr Manoj Kumar, Asst Director, MPEDA visited LvMC on 14.07.2017.

A brief presentation was made by the Project in-charge on the activity and present status of BMC. Strategies for enhancement of broodstock quality supplied by BMC was the key point discussed during the meeting.



Dr. T. G. Manoj Kumar & Mr Jeff during discussion at LvMC



Installation of mobile Bed Bioreactor room in the facility



Technical team observing algae culture tank



Technical team observing PLs in phase I rearing



Visit of Sri Lankan delegates at L. vannamei Multiplication Centre, Vizagon 25.07.2017

Sri Lankan delegates, Mr. Timothy O'Reilly, Mr. Dilan Fernando, Mr. Prasad Eleirisinghe and Mr. Saman of M/s Taprobane Sea foods Pvt. Ltd., visited the facility of RGCA L. *vannamei* Multiplication Centre along with the Vice Chairman, MPEDA, Mr. Ch. Kishore Kumar on 25.07.2017. The delegates were briefed about the activity of the Centre on which they expressed their interest for the establishment of

a *vannamei* hatchery at Sri Lanka. The importance of the bio-security protocols in BMC were explained. The delegates appreciated the work and efforts put in by MPEDA - RGCA for establishing such a unique facility for L. *vannamei* Broodstock Multiplication in India and they expressed their interest to procure RGCA produced *vannamei* brooders for future.



Sri Lankan Delegates at LvBMC, Vizag



Visit of the Department of Fisheries officials, Andhra Pradesh to the LvBMC Facility

As part of their six months long departmental training at State Institute of Fisheries Technology (SIFT), Kakinada, Andhra Pradesh, a twenty five member team comprising of Field level officers, Inspector of Fisheries and Fisheries Development Officers of various District Fisheries offices of Andhra Pradesh visited RGCA- Lv Multiplication Centre (LvMC), Visakhapatnam, on 08 th March 2018. The

team was headed by Sri Lakshmana Rao, Principal, SIFT, Kakinada.

The visiting team were briefed on the aim and activities of the project. They were also given opportunity to view and understand about the different amenities and supporting systems available in the Facility.





Visit of the Foreign Consultant to LvMC

Mr. Jeff Prochaska from M/s Oceanic Institute, Hawaii, USA, visited the LvMC Facility on 25.03.2018 and checked the health status of the broodstock. Discussion on the feeding schedule of the current batch for improving brooder performance and as well as the upcoming batch was discussed.



Mr. Jeff from M/s Oceanic Institute at the L. vannamei Broodstock Multiplication Centre





Visit of the Andhra Pradesh, Special Chief Secretary (DAHDF) and Fisheries Commissioner, to AQF on 04.08.2017

The Andhra Pradesh Special Chief Secretary of Animal Husbandry and Fisheries, Shri. J. S. Venkateswara Prasad and Fisheries Commissioner, Shri. Rama Shankar Naik, I.A.S., visited AQF on 04.08.2017 to oversee the quarantine operation of the facility. The dignitaries were briefed on the various steps involved in quarantine process of imported *L. vannamei* brooders and the bio-security followed in the facility.



Andhra Pradesh Special Chief Secretary, Fisheries, Shri. J. S. Venkateswara Prasad, IAS and Fisheries Commissioner Sri. Rama Shankar Naik, IAS interacting with the staff of AQF



Team from Andhra Pradesh, Fisheries Department at AQF on 24th August 2017



The study team from State Fisheries, Andhra Pradesh, being apprised on the infrastructure and supporting components of AQF



Sri. Srinivas, Assistant Director Fisheries, Andhra Pradesh and Shri. Mathan Ramaiah, Architect deputed by AP Fisheries for proposed AQF at Vizag, Andhra Pradesh attentively listening to a staff briefing on the quarantine operation of the facility

Team from Andhra Pradesh, Fisheries Department at AQF on 24th August 2017



A three member team from the State Fisheries Department, Andhra Pradesh, visited AQF, Neelankarai on 24.09.2017 to study the infrastructure details of the facility created by RGCA-MPEDA as well as its quarantine operation. The visit was a prelude for the establishment of the proposed AQF at Vizag in Andhra Pradesh, for which, MPEDA had signed an MOU with the Andhra Pradesh State Fisheries. The team were given in-depth information on the infrastructure components of the facility and its operation.



Visitors at Seabass and Mud crab Hatchery, Thoduvai



Dr. Naik, Joint Commissioner of Fisheries, Maharashtra interacting with the staff of Seabass Hatchery



Dr. Binay Chakraborty, Project Director, Bangladesh visited Seabass Hatchery on 03/07/17



Officials from CP Company visited Seabass Hatchery on 21/07/2017



Dr. R. Arthur James, Head, Dept. of Marine Science, Bharathidasan University visited Seabass Hatchery on 11/07/2017



Participants of the training programme on "Live Feed culture for Marine Hatchery Operations" dt: held during 22-26 July' 2017



Dr. M.K. Anil, Scientist incharge, CMFRI, visited Thoduvai Hatchery project on 04/08/2017



Shri. J.S.V. Prasad, IAS, Spl. Chief Secretary and Shri. Ramasankar Naik, IAS, Commissioner of Fisheries, Govt. of Andhra Pradesh visited Mudcrab Hatchery on 04/08/17

Following were the comments penned by the Spl. Chief Secretary in the visitor's book:

"This is a world class facility. There is a lot of science involved in the work being done. The staffs are amazing. I wish senior officials of GOI recognize their good work. My whole hearted appreciation to the staff who are doing great work"



Dr. K. Kathiresan, Former Dean & Director, CAS in Marine Biology, Annamalai University, Portonovo and Dr. N. Rajendran, Associate Professor, Govt. Arts & Science College, Mutlur visited Mudcrab Hatchery on 13/08/2017



Dr. R. Kirubakaran, Dr. R. Senthilkumar and Dr. J. Santhanakumar, NIOT, Chennai visited Mudcrab Hatchery on 19/08/2017



Visitors at Marine Finfish Hatchery Project, Pozhiyoor

Date	Name and address	Purpose
25.04.2017	Ms. Maja Jose. P, Asst Director of Fisheries accompanied by 22 Staff Trainees Department of Fisheries Govt. of Kerala	Visited hatchery facilities
10.07.2017	Shri. Dr. S. Karthikeyan, I A S, Director, Fisheries, Govt. of Kerala.	Visited Hatchery at Pozhiyoor along with Officials of Dept of Fisheries, Kerala
15.07.2017	Dr. A.K Abdul Nazar, Scientist in Charge & Team, CMFRI, Mandapam Research centre, Ramnad District, Tamil Nadu	Visited Hatchery facilities at Pozhiyoor
02.09.2017	Shri. N. Muruganandan, IAS Principal Resident Commissioner, Tamil Nadu House, New Delhi	Visited hatchery at Pozhiyoor and Sea cage farm at Muttom
13.12.2017	Shri Vijayakumar DD& Shri Shankarapillai MPEDA, Kochi	Official
10.02.2018	DR. W. Selvamurthy, President, Amity Science, Technology & Innovation Foundation, Amity University, Noida, UP	Visited Hatchery facilities at Pozhiyoor



Important Events



The Hon'ble Minister for MoCI Shri Suresh Prabhu in discussion with Chairman, MPEDA at the RGCA Pavilion during the Global Konkani festival.



Chairman, MPEDA / President, RGCA, discussing with USFDA officials, Mr. Chris Priddy and Mr. Stanley Serfling regarding possible collaborations for Skill Development in Best Management Practices in Aquaculture on 18th November, 2017 at MPEDA, Kochi



Chairman, MPEDA, Joint Secretary (Commerce), Director, MoCI and Secretary, MPEDA attending the meeting convened by the Chief Secretary of Andhra Pradesh, Shri Dineshkumar, I.A.S. on 11/09/2017 at Chief Secretary's Chamber, Secretariat, Andhra Pradesh regarding Antibiotics issues in Aquaculture and formation of Taskforce Committee for monitoring the usage of banned antibiotics if any in Aquaculture in Andhra Pradesh



Dr.S. Kandan, Project Director, RGCA, delivering a Lecture on MPEDA RGCA's Initiative for Export Oriented Diversified Aquaculture during the AQUIZ Fish Show at Andhrapradesh during December 2017



M PEDDA - RGCA signs Service Agreements with Department of Fisheries, Govt of Andhra Pradesh on 27/07/2017 for establishing AQF for L. vannamei, Seabass & Mud Crab Hatchery in association with Dept. of Fisheries, Govt. of Andhra Pradesh



Chairman, MPEDA / President, RGCA's meeting with the Chief Secretary of Andaman & Nicobar Administration, Shri Anindo Majumdar, I.A.S. on 17/10/2017 regarding Possible Initiative of Aquaculture Projects in Andaman & Nicobar Islands and seeking co-operation from Dept. of Fisheries for implementation



Dept. of Fisheries, Tripura successfully transported the GIFT Seeds from MPEDA RGCA's Tilapia Project, Manikonda, Andhra Pradesh, with a 100% survival after 30 hrs. of journey during November, 2017

USFDA MPEDA RGCA jointly organized Training Course on Good Aquaculture Practices and Food Safety Prevention Control for Aquaculture Farms for farmers, Fisheries officials, Hatchery Operators and Processors on 13 & 14, Nov., 2017 at RGCA Head Quarters, Sirkazhi





RGCA Meetings

Two meetings of Executive Committee were conducted during the year 2017-18.

56th EC of RGCA

56 th EXECUTIVE COMMITTEE MEETING OF RGCA HELD ON THE 19TH SEPTEMBER 2017 AT HOTEL TAJ GATEWAY, VIJAYAWADA, ANDHRA PRADESH. The following members were attended the meeting.

1. Dr. A Jayathilak, IAS, Chairman, MPEDA & President, RGCA
2. Shri B. Sreekumar, Secretary, MPEDA
3. Shri Seetharama Raju, Additional Director, Department of Fisheries, A.P
4. Shri J. Natarajan, Deputy Director of Fisheries & Fishermen Welfare, Govt of Puducherry (attended in place of Shri A.VincentRayar, Director)
5. Smt. E.V Deepa, Chief Accounts Manager, MPEDA
6. Dr. S. Kandan, Project Director, RGCA

57th EC of RGCA

57 th EXECUTIVE COMMITTEE MEETING OF RGCA HELD ON THE 28th MARCH 2018 AT HOTEL GRAND BAY, VISAKHAPATNAM, ANDHRA PRADESH. The following members were attended the meeting.

- Shri B. Sreekumar, Secretary, MPEDA chaired the meeting
1. Shri. T.Dola Shankar, IOFS, Director(M), MPEDA
 2. Shri. RamashankarNaik, IAS, Commissioner of Fisheries, A.P.
 3. Dr. Paul Pandian, Fisheries Development of Commissioner, MOA
 4. Dr. A.S Ninawe, Senior Advisor, DBT
 5. Shri J. Natarajan, Deputy Director of Fisheries & Fishermen Welfare, Govt of Puducherry (attended in place of Shri A.VincentRayar, Director)
 6. Dr. S. Kandan, Project Director, RGCA



General Body Meeting

The 24th Annual General Body Meeting of RGCA was held on 19th September 2017 at Hotel Taj Gateway, Vijayawada, Andhra Pradesh. The following members were attended the meeting.

1. Dr. A Jayathilak, IAS, Chairman, MPEDA & President, RGCA
2. Shri B. Sreekumar, Secretary, MPEDA
3. Shri Seetharama Raju, Additional Director, Department of Fisheries, A.P
4. Shri J. Natarajan, Deputy Director of Fisheries & Fishermen Welfare, Govt of Puducherry (attended in place of Director)
5. Smt. E.V Deepa, Chief Accounts Manager, MPEDA
6. Dr. S. Kandan, Project Director, RGCA
7. Dr. Ram Mohan, Joint Director (Mktg), MPEDA
8. Shri C.wilson, Deputy Director (Aqua), MPEDA RC, Nagapattinam



Annual Accounts

SELVAKUMAR S & ASSOCIATES
Chartered Accountants



CA.S.Selvakumar B.Com, FCA, D.L.S.A (ICAI)

No. 1, First Floor, Balaji Street
Kodambakkam, Chennai - 600 024
Phone : 044-24807686
Email : selvakumar@ssacas.com
Website : www.ssacas.com

INDEPENDENT AUDITORS' REPORT

To the Members of **Rajiv Gandhi Centre For Aquaculture**

Report on the Financial Statements

We have audited the accompanying financial statements of M/s. **Rajiv Gandhi Centre for Aquaculture**, a society registered under Tamilnadu Society Registration Act, 1975 ("the Society"), which comprise the Balance Sheet as at 31st March, 2018, the Statement of Income & Expenditure, the Receipts and Payments Account for the year then ended, and a summary of the significant accounting policies and other explanatory information (or "the financial statements").

Management's Responsibility for the Financial Statements

Management of the Society is responsible for the maintenance of adequate accounting records for safeguarding the Assets and for preventing and detecting frauds and other irregularities, the selection and application of appropriate accounting policies, making judgements and estimates that are reasonable and prudent and the design, implementation and maintenance of adequate internal financial controls that are operating effectively for ensuring the accuracy and completeness of the accounting records relevant to the preparation and presentation of these financial statements that give a true and fair view and are free from material misstatement, whether due to fraud or error which have been used for the purpose of preparation of the financial position, the financial performance of the organization.

Auditor Responsibility

Our responsibility is to express an opinion on these financial statements based on our audit. While conducting our audit, we have taken into account the provisions of the Act, the Accounting and Auditing Standards and matters which are required to be included in the audit as per the provisions of the Act. We conducted our audit in accordance with auditing standards generally accepted in India. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free from material misstatement. An audit includes examining, on a test basis, evidence supporting the amounts and disclosures in the financial statements. An audit also includes assessing the accounting principles used and significant estimates made by the management, as well as evaluating the overall financial statement presentation. We believe that our audit provides a reasonable basis for our opinion.

We further report that:

- a) We have obtained all the information and explanations, which to the best of our knowledge and belief were necessary for the purpose of our audit.

SELVAKUMAR S & ASSOCIATES
CHARTERED ACCOUNTANTS
FRN 015213S, No.1, 1st Floor, Balaji Street,
Kodambakkam, Chennai-600 024



- b) In our opinion the Society has kept proper books of accounts so far as appears from our examination of such books.
- c) The Balance Sheet, Income and Expenditure account and Receipts and Payments account dealt with by this report are in agreement with the books of accounts.

Emphasis of Matter


The aggregate value of fixed assets held by the Society net of depreciation as at the end of the reporting period is Rs. 6,775.11 Lakhs. It is observed that manual fixed assets register being maintained at all projects including head office. Presently the fixed assets register used for computation of depreciation does not have numbers of items of assets in it. It is suggested to have consolidated fixed assets register mentioning asset-wise unique no, location, date of Purchase, supplier name, description of asset, total value, no of items, depreciation rate, expected life etc.

Opinion

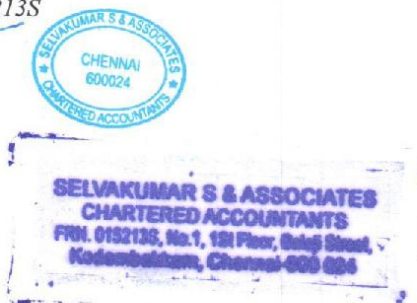
In our opinion and to the best of our information and according to the explanations given to us the said Balance Sheet, the Income and Expenditure and Receipts & Payment accounts give a true and fair view:

1. In so far as it relates to the Balance Sheet, of the state of affairs of the Society as at 31st March 2018,
2. In so far as it relates to the Income and Expenditure account of the excess of expenditure over income for the period ended on that date, and *Also Refer analysis of income & expenditure given in Note - 9 to the financial statements*
3. In so far as it relates to the Receipts & Payment account of the receipts and payments for the year ended on that date

For **Selvakumar S & Associates**
Chartered Accountants
Firm Registration No.015213S


S. Selvakumar

Proprietor
Membership No.225337
Date: 10.07.2018
Place: Sirkali



RAJIV GANDHI CENTRE FOR AQUACULTURE (MPEDA, Ministry of Commerce & Industry, Govt. of India)
 3/197, Poompuhar Road, Karaimedu Village, Sattanathapuram - 609 109
BALANCE SHEET AS ON 31.03.2018

(Amount in Indian Rupees)					
Previous Year (2016-17)	LIABILITIES	Current Year (2017-18)	Previous Year (2016-17)	ASSETS	Current Year (2017-18)
1,32,31,97,338.69	D) CAPITAL ACCOUNT	1,32,31,97,338.69	22,60,37,149.26	I) NON-RECURRING EXPENSES:	20,18,13,836.18
	Add : Fund from MPEDA	23,15,00,000.00	91,23,161.26	Aquatic Quarantine Facility (AQF),	84,88,003.31
	Add : Grant-in-Aid Fund from NBFCIR for CAPL	10,07,000.00	1,89,91,591.10	Artemia & Demonstration Farm Project,	1,68,19,672.27
	Less : Excess of Expenditure over income	12,15,56,068.95	1,43,41,48,269.73	Pilot Scale Mangrove Crab Project,	7,06,28,815.27
85,07,40,251.00	II) RGCA CORPUS FUND	93,49,48,579.00	26,66,85,602.25	Marine Fin Fish Hatchery/Cobia	25,42,11,205.03
			27,26,712.17	Domestication of Tiger Shrimp Project	23,63,049.06
	III) CURRENT LIABILITIES:		6,71,48,609.56	Grouper Project, Portblair	6,66,94,073.12
	(EM Deposits & Payables)		2,26,70,734.95	TTTAC-Head Quarters	84,77,802.87
1,75,000.00	Scampi Broodstock Development,	1,75,000.00	86,93,295.44	Aquaculture Demonstration Farm Project,	1,99,98,607.19
41,40,909.00	Domestication of Tiger Shrimp Project/units	26,19,668.00	3,49,955.18	Seabass Hatchery	3,14,888.54
9,31,488.00	TTTAC-Head Quarters,	23,18,464.00	57,19,112.37	Nauplii Production Centre (NPC) A&I	23,95,536.93
2,02,933.00	Artemia Project,	67,671.00	26,32,170.84	Scampi Broodstock Development Project	22,86,493.92
11,163.00	Aquaculture Demonstration Farm Project,	83,724.00	2,66,42,390.81	Tilapia Project,	2,30,19,359.93
2,57,09,337.00	Aquatic Quarantine Facility (AQF),	61,53,613.00		II) CURRENT ASSETS	67,75,11,343.61
2,94,010.00	L.Vannameli Multiplication Centre,	2,81,347.00		(Deposits, Advances & Receivables)	
1,50,000.00	Tilapia Project,	2,39,398.00	3,49,717.00	TTTAC-Head Quarters	4,98,199.00
18,588.00	Mudcrab Crab Project,	18,588.00	3,89,098.16	Seabass Hatchery	4,14,807.16
14,05,965.00	Seabass Hatchery,	14,05,965.00	1,24,653.00	Aquaculture Demonstration Farm Project,	1,36,174.00
11,06,987.00	Marine Fin fish Hatchery Project,	1,91,450.00	1,36,828.00	Mudcrab Crab Project, Thoduvai	1,46,929.00
			4,67,915.00	Scampi Broodstock Development,	5,50,668.00
			4,24,809.00	L.Vannameli Multiplication Centre	4,49,829.00
			2,63,223.00	Domestication of Tiger Shrimp Project/units	2,60,765.00
			3,33,293.00	Artemia Project,	5,18,219.00
			27,887.00	Grouper Project,	28,050.00
			3,43,296.00	Marine Fin fish Hatchery Project,	3,53,116.00
			3,00,175.00	Tilapia Project,	3,17,597.00
			12,27,334.00	Aquatic Quarantine Facility (AQF),	13,53,096.00
			48,70,93,364.81	III) FIXED DEPOSITS:	50,27,449.16
			85,07,40,251.00	Fixed deposit (RGCA)	65,49,34,197.54
			4,30,670.00	Fixed deposit (MoCI)	93,49,48,579.00
			1,52,94,609.00	IV) BANK GUARANTEE	1,58,98,82,776.54
				V) ACCOUNTS RECEIVABLES	4,47,845.00
				VI) CLOSING BALANCE:	1,93,39,918.50
			114	Cash in hand	117
			11,95,91,664.14	Cash at bank	9,04,42,286.92
			2,20,80,83,969.69	TOTAL	9,04,42,403.92
			2,38,26,51,736.73	TOTAL	2,38,26,51,736.73

SERVAKUMAR S & ASSOCIATES
CHARTERED ACCOUNTANTS
FRN 0152135, No.1, 181 Floor, Bangal Street,
Kodambakkam, Chennai-600 024

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SELVAKUMAR S & ASSOCIATES
CHARTERED ACCOUNTANTS
 FRN. 0152135, No. 1, 1st Floor, Sakthi Street,
 Kodambakkam, Chennai-600 024



TH. V. S. CANDIA
 AQUACULTURE RGCA

3/197, Poompuhar Road, Karaimedu Village, Sattanathapuram - 609 109

SELVAKUMAR S & ASSOCIATES
CHARTERED ACCOUNTANTS
FRN. 015213S, No. 1, 1st Floor, Bala Street,
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RAJIV GANDHI CENTRE FOR AQUACULTURE (MPEDA, Ministry of Commerce & Industry, Govt. of India)
3/197, Poompuhar Road, Karaimedu Village, Sattanathapuram - 609 109
RECEIPTS AND PAYMENTS ACCOUNT FOR THE YEAR ENDED 31.03.2018

		(Amount in Indian Rupees)	
RECEIPTS		2017-18	2017-18
1. Opening Balance:			
- Cash in Hand	114		1,52,94,628.56
- Cash at Bank	11,95,21,664.14	11,95,91,778.14	5,43,84,746.05
2. Grant Received:			1,55,42,588.00
Transfer of fund from MPEDA for RGCA	23,15,00,000.00		4,21,09,741.40
Transfer of fund from MPEDA for SSP-Vallarpadam	2,00,00,000.00		67,53,638.00
Transfer of fund from NBFG for CAPL Surveillance prog.	10,07,000.00	25,25,07,000.00	94,07,693.10
3. Fund Realised from Term Deposits		6,75,15,213.00	36,36,023.90
4. Income Received Through R&D Products & Other Receipts:			59,90,375.94
Seabass Hatchery Project, Thoduva	99,55,298.00		1,83,37,482.10
Technology transfer training & Admn. Complx (ITTAC-HQ) Sirkali	49,28,370.00		2,98,21,931.95
Aquaculture Demonstration Farm, Karaikal & Mahendrapalli	37,20,888.00		4,49,52,181.00
Domestication of Tiger Shrimp Project, Portblair	95,602.00		6,16,75,761.50
Artemia Project, Tuticorin & Ramnad	11,28,240.00		
Scampi Project, Vijayawada	1,98,438.00		
Pilot scale of Mud Crab Hatchery Project, Thoduva	49,45,193.00		
Tilapia Project, Vijayawada	1,07,66,062.00		
Marine Finfish Hatchery /Gobia Project, Trivandrum/Muttom	36,51,612.00		
Aquatic Quarantine Facility(AQF), Chennai	6,88,28,312.00		
Lyannamed Multiplication Centre Project, Vizag	9,99,20,115.00	20,81,38,130.00	
5. Interest Income:			6,36,731.00
Interest Earned on Fixed Deposits	4,32,47,290.51		
Interest Earned on Electricity Deposits etc.,	97,110.00		23,57,19,802.73
6. Refund / Temporary Advances:			
Interest from Margin Money Earned on bank guarantee	18,567.00		2,30,69,317.00
7. Realisation of Old Assets			
8. Refund from STDR for Settlement			
9. Accounts Receivable : Seabass Seeds			10,00,000.00
TOTAL		69,46,08,028.65	3,58,32,982.50
			3,68,32,982.50
			117
			9,04,42,403.92
			69,46,08,028.65

RAJIV GANDHI CENTRE FOR AQUACULTURE RGCA



Handwritten signature
PROJECT DIRECTOR

SELVAKUMAR S & ASSOCIATES
CHARTERED ACCOUNTANTS
 FRN. 015213S, No.1, 1st Floor, Belsaji Street,
 Kodambakkam, Chennai-600 024

Significant Accounting Policies

1. Basic Information

Rajiv Gandhi Centre for Aquaculture is the Research & Development arm of the Marine Products Export Development Authority (MPEDA), Ministry of Commerce & Industry. RGCA is functioning as a society, registered under Tamil Nadu Societies Registration Act, 1975 since January 5th 1996. RGCA is actively involved in the development of various Sustainable Aquaculture Technologies that are bio secure, eco-friendly, traceable and with low carbon outputs, for seed production and grow out farming of various aquatic species, those having export potential in particular. RGCA is also developing a state-of-the-art technology transfer and training centre for disseminating the technologies developed at the various projects established at different locations in the country to the aquaculture industry in India. The Society is also registered under 12AA of the Income-tax Act, 1961 and hence an exempted entity under Income-tax Law.

2. Basis of Accounting

The accounts of the Society have been prepared on accrual accounting basis, in accordance with the generally accepted accounting principles (GAAP) in India. The Accounts of the Society are prepared under historical cost convention method and on the going concern concept. Items of income and expenses are accounted for on accrual basis unless for the cases where there is specific grant condition to make provision for expenses and is as per the generally accepted accounting principles and practices and Accounting Standards issued by the Institute of Chartered Accountants of India for NGOs where applicable, except otherwise stated.

3. Revenue Recognition

Income has been accounted on accrual basis and expenses which pertain to generate the income have been booked on accrual basis in the same financial year as follows:

- a. The income of the society is derived from realization of Research & Development (R&D) products in various projects, sale of scrap materials and other miscellaneous services.
- b. Interest income from term deposits are being accounted on the basis of maturity except Corpus fund deposit wherein it is recognized on a time proportion basis taking into account the amount deposited and with applicable rate of interest.



FOR RAJIV GANDHI CENTRE FOR AQUACULTURE (RGCA)


PROJECT DIRECTOR

SELVAKUMAR S & ASSOCIATES
CHARTERED ACCOUNTANTS
FRN. 015213S, No.1, 1st Floor, Balaji Street,
Kodambakkam, Chennai-600 024

4. Government Grants and other Funds:

- a. Government grants received through MPEDA and other government agencies are recognized on receipt basis. Those grants generally with terms and conditions to be complied with by RGCA.
- b. Income from Corpus fund are in the nature of Corpus fund as per the Corpus Fund rules and hence takes the character of restricted funds, accordingly not being treated as Income to the extent not spent and credited to the relevant Corpus Fund.
- c. Government grants are not routed through the Income and expenditure account, as these grants are tied-up grants and to be used for specified projects and RGCA is liable to submit true and correct account of the expenditures to the granting authority and also responsible to submit utilization certificate to the said authorities, hence none of the grants are in the nature of income in full hence, these grants as and when received credited to the fund account (Capital Account) and not credited to the Income and Expenditure Account but to the extent amount spent on the project have been adjusted with these fund(s).

5. Fixed Assets & Depreciation

- (a) Fixed assets are stated at cost less depreciation. Cost includes, all the expenses incurred to bring the assets to its present location and condition.
- (b) Depreciation on fixed assets is calculated as per written down value (WDV) method, based on rates prescribed under the Income-tax Act, 1961, as amended from time to time. For assets which are put-to-use for less than 180 days during the year, 50% of normal depreciation is provided and in other cases 100% depreciation provided.

6. Investments.

All the funds of the Society being temporarily invested in the prescribed investments under Income-tax Act, 1961 as amended from time to time.

7. Internal Controls

The Society has adequate internal control procedures commensurate with the size of it, and the nature of its Research and Development activities. The Society is also subjected to internal audit, AG Audit, Commercial Audit and audit by the concerned authority granting the funds.

8. Taxes on Income.

The society has registered under section 12AA of the Income-tax Act, 1961; accordingly the income of the Society is subject to section 11 & 12 of the act. Hence, there is no income-tax liability for the Society.

FOR RAJIV GANDHI CENTRE FOR AQUACULTURE (RGCA)


SELVAKUMAR S & ASSOCIATES
CHARTERED ACCOUNTANTS
FRN. 015213S, No.1, 1st Floor, Balaji Street,
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PROJECT DIRECTOR

Notes on forming part of Financial Statements

1. Analysis of Income & Expenditure

On considering and analyzing to the previous years, RGCA has improved significantly on financial stability of self sufficient to generate revenues to support the projects as follows:-

Particulars	Amount (Rs in Crores) 31.03.2018
Income	
Income from Sale of Seeds, Broodstock, etc.,	13.58
Income from Testing Services etc.,	7.19
Income from Technology Transfer & training fee	0.29
Miscellaneous Income (Scrap, Insurance Claim, Guest Room, Tender fee, Sale of RGCA Newsletter and proceedings & Co-conut sales etc.,	0.26
Interest income from TDRs – Self Generated Funds	4.33
Total Income	25.65
Expenditure (Before Depreciation)	
Recurring Expenditure	29.60
Non-operative Expenditure (Written off & Loss on sale of Fixed Assets)	0.49
Total Expenditure	30.09

During the year the corpus fund investments has generated Rs.8.42 Crores and as at 31st March'2018 and the same has been accumulated in the corpus fund in the balance sheet aggregating to Rs.93.50 Crores. The said interest as per the RGCA Foundation Corpus Fund Management Committee (RFCFMC) Rules, 2008', not credited to the Income & Expenditure Account.

2. Grants in Aid Funds & other sources:

The following are the substantial source of funds to the society:-

S.No	Sources of Funds	Amount (Rs in Crores)
1	MPEDA for RGCA Projects	23.15
2	MPEDA for SSP Vallarpadom	2.00
3	NBFGR-CAPL Surveillance Program	0.10
4	Proceeds from Term Deposits	6.75

FOR RAJIV GANDHI CENTRE FOR AQUACULTURE (RGCA)

S. S. S.

R. S. S.
DIRECTOR



SELVAKUMAR S & ASSOCIATES
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3. Fixed assets of written down value of Rs.22.33 lakhs as at 31.03.2018 have been utilized by SSP-Vallarpadom Project and concerned depreciation have been charged to Income & Expenditure Account. With respect to other expenditure both recurring and non-recurring have been incurred by RGCA as well as sale of seeds & other amounts are receivable from MPEDA. It was duly disclosed in the balance sheet as receivable.
4. The following items reported in the financial statements as receivable are subject to confirmations.

S.No	Particulars	Amount (Rs) 31.03.2018
1	Amount receivable from MPEDA against OSSPARC – Odisha.	10,00,000.00
2	Amount receivable from MPEDA against Self Sufficiency Project- Vallarpadom	1,77,64,527.50
	Total	1,87,64,527.50

5. Contingent Liabilities

S.No	Particulars of the dispute	Forum in which it is pending	Amount of liability (INR)
1	Civil dispute with a Contractor which is pending before the Arbitration Committee.	Arbitration Committee	Rs.1,71,36,575/- plus interest @ 18% p.a on this amount from 1 st July, 2010 to till date.
2	Appeal before CESTAT for service tax matter on the applicability and consequential liability on RGCA is pending till date. Tax paid under protest in this regard aggregates to Rs.3,04,541 before filing appeal.	CESTAT	32,31,934




SELVAKUMAR S & ASSOCIATES
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For RAJIV GANDHI CENTRE FOR AQUACULTURE (RGCA)

 PROJECT DIRECTOR

6. Other Matters

- During the year the financial year, operations of the following projects were closed and consequential impacts have been given in the income and expenditure account and balance sheet.

1. High Health Tiger Shrimp Supply Production Unit (DTSP-HHTSSPU), Chirala

The Project was commenced in the financial year 2013-14 in order to produce pathogen free High health Shrimp seed to farmers & hatchery owners and it was found during the reporting period that there is no feasible outcome expected to flow to RGCA in foreseeable future. Hence, the Competent Authority has decided to drop the project in order to cut down the expenditure. In this scenario the total Non-recurring expenditure (Fixed Assets) to the tune of Rs. 27.69 Lakhs being written down value (WDV) had been discarded / Sold out / dealt with due approval of the Competent Authority as follows:-

S.No	Particulars	Amount (Rs in Lakhs)
1	Sale of Fixed assets	5.92
2	Loss on above sale of Fixed Assets.	10.80
3	Assets at the project written off to Income & expenditure	10.97
	Total Assets	27.69

2. SCAMPI Broodstock Development Project, Vijavawada

The Project was commenced in the financial year 2006-07 to produce and breed "Neofemales" Scampi seed to the fresh water Prawn farming industry and it was found during the reporting period that there is no feasible outcome expected to flow to RGCA in foreseeable future. Hence, the Competent Authority has decided to drop the project in order to cut down the expenditure. In this scenario the total Non-recurring expenditure (Fixed Assets) to the tune of Rs.29.07 Lakhs being written down value (WDV) had been discarded / Sold out / dealt with due approval of the Competent Authority as follows:-

S.No	Particulars	Amount (Rs in Lakhs)
1	Sale of Fixed assets	4.50
2	Loss on above sale of Fixed Assets.	0.05
3	Assets at the location written off to Income & expenditure	24.52
	Total Assets	29.07

7. Previous year's figures have been regrouped and/or reclassified /rearranged where ever considered necessary to confirm current year's presentation.


SELVAKUMAR S & ASSOCIATES
 CHARTERED ACCOUNTANTS
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PROJECT DIRECTOR



Manpower at RGCA

Head of the Institution Dr. A. Jayathilak, IAS

Sl.No.	Name of the Staff	Designation
RGCA HEAD QUARTERS, KARAIMEDU, SIRKALI		
1	Dr. S. KANDAN	Project Director
2	Dr. T. G. MANOJKUMAR	Project Co-ordinator
3	Dr. Anup Mandal	Project Manager (Aqua.Genetics& Pathology)
4	Shri T. Sivasubramanian	Junior Project Manager
5	Dr. K. Iyyappan	Assistant Technical Manager
6	Smt. B. Thiripurasundari	Assistant Project Manager (P & A)
7	Shri. D. Rajesh	Assistant Accounts Manager
8	Shri. K. Marieswaran	Junior Proj.Manager (P & A)
9	Shri. M. Mahadevan	Accountant
10	Shri. V. Subash	Accountant
11	Shri. K. Arumugam	Accountant
12	Dr. N. Babu Rao	Asst. Project Manager
13	Shri. A.Elamaran	APM (Works)
14	Dr. Mithun Raj	Assistant Technical Manager
15	Shri. B. Babu	Assistant Technical Manager
16	Smt. K. M. Anjali	Assistant Technical Manager
17	Shri. S. John	Library Assistant
18	Shri. L. Ruban	Assistant Technical Manager
19	Shri. E. AnanandaJothi	Assistant Technical Manager
20	Dr. L. Mohan Kumar	Assistant Librarian
21	Shri. G. Sathiyaraj	Assistant Technical Manager
22	Shri. K. Sankar	Purchase/Store Assistant
23	Shri. K. Rajendran	Administrative Assistant
24	Shri. U. Chinnadurai	Driver
DTSP, A & N ISLANDS		
26	Shri. D. ThineshSanthar	Project Manager
27	Shri. S. Nagaraj	Assistant Project Manager
28	Shri. P. Bangaraju	Junior Project Manager
29	Shri. G. Siva Krishna	Assistant Technical Manager

30	Shri. BinodGharami	Facility Manager
31	Shri. M. Shailendar	Assistant Project Manager
32	Shri. K. Praveen Raj	Assistant Project Manager (P & A)
33	Shri. K. P. Sarmal	Assistant Technical Manager
34	Shri. D. Silambarasan	Assistant Technical Manager
35	Shri. BooradaKishor	Assistant Technical Manager

DTSP-BMC, KANYAKUMARI

36	Shri. C.Elamparuthi	APM (Works)
37	Shri. S.V Rajarajan	Accountant

GROUPER PROJECT, A & N ISLANDS

38	Shri. S.Vijayakumar	Assistant Technical Manager
39	Shri. G. Elumalai	Accountant

ARTEMIA PROJECT, TUTICORIN

40	Shri. Samaya Kannan	Assistant Project Manager
41	Shri. S. Balachander	Assistant Technical Manager
42	Shri. S.Moovendan	Assistant Technical Manager
43	Shri. G.Karthik	Accountant

AQUATIC QUARANTINE FACILITY, CHENNAI

44	Dr. Amiya Kumar Panda	Project Manager
45	Dr. D. Kannan	Assistant Project Manager
46	Dr. M. C. Remany	Project Manager-SRPM
47	Shri. K. Aadhavan	Facility Manager
48	Smt. Daly Cyriac	Assistant Technical Manager
49	Shri. K. Lakshmi Narayana	Assistant Technical Manager
50	Shri. Erra Suresh Babu	Assistant Technical Manager
51	Shri. K. Sateesh Kumar	Assistant Technical Manager
52	Shri. P. KrishnaKanthVaradha Raju	Assistant Technical Manager
53	Ms. SruthiPrem	Assistant Technical Manager
54	Shri. G. Ramu	Accountant
55	Shri. K. V. Ravikumar	Accountant

SEABASS/MUD CRAB HATCHERY, THODUVAI

SEABASS HATCHERY

56	Dr. V. ShanmugaArasu	Assistant Project Manager
57	Shri. R. Senthil Kumar	Mech-cum-Elec Supervisor
58	Shri. A. S. Vasudevan	Electrician-cum-Mechanic
59	Shri. V. Parthasarathy	Accountant
60	Shri. Y. Nayanaswamy	Assistant Technical Manager
61	Shri. M. Saravanan	Assistant Technical Manager
62	Shri. T. Sundaresan	Assistant Technical Manager

MUD CRAB HATCHERY

63	Shri. K. Velmurugan	Assistant Technical Manager
64	Shri. S. Viswanathan	Assistant Technical Manager

AQUACULTURE DEMO FARM, KARAIKAL/MAHENDRAPALLI

65	Dr.G.KDinakaran	Assistant Project Manager
66	Shri. V. S. Aravind	Assistant Technical Manager
67	Shri. B. Suresh	Assistant Technical Manager
68	Shri. K. Maheswaran	Accountant

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73	Shri Mathews Varkey	Assistant Project Manager
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75	Shri. U. Gunasekaran	Assistant Technical Manager
76	Shri. G. Rajeesh	Assistant Accounts Manager
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80	Shri. Johny T. Varghese	Junior Project Manager
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89	Ms. VaranasiLaxmi	Assistant Technical Manager
90	Shri. Aswini Kumar	Assistant Technical Manager
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