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MARICULTURE HORIZON

Indigenous Technologies & Achievements

Mariculture Division, Veraval Regional Station
ICAR – Central Marine Fisheries Research Institute

Mariculture Horizon: Indigenous Technologies & Achievements

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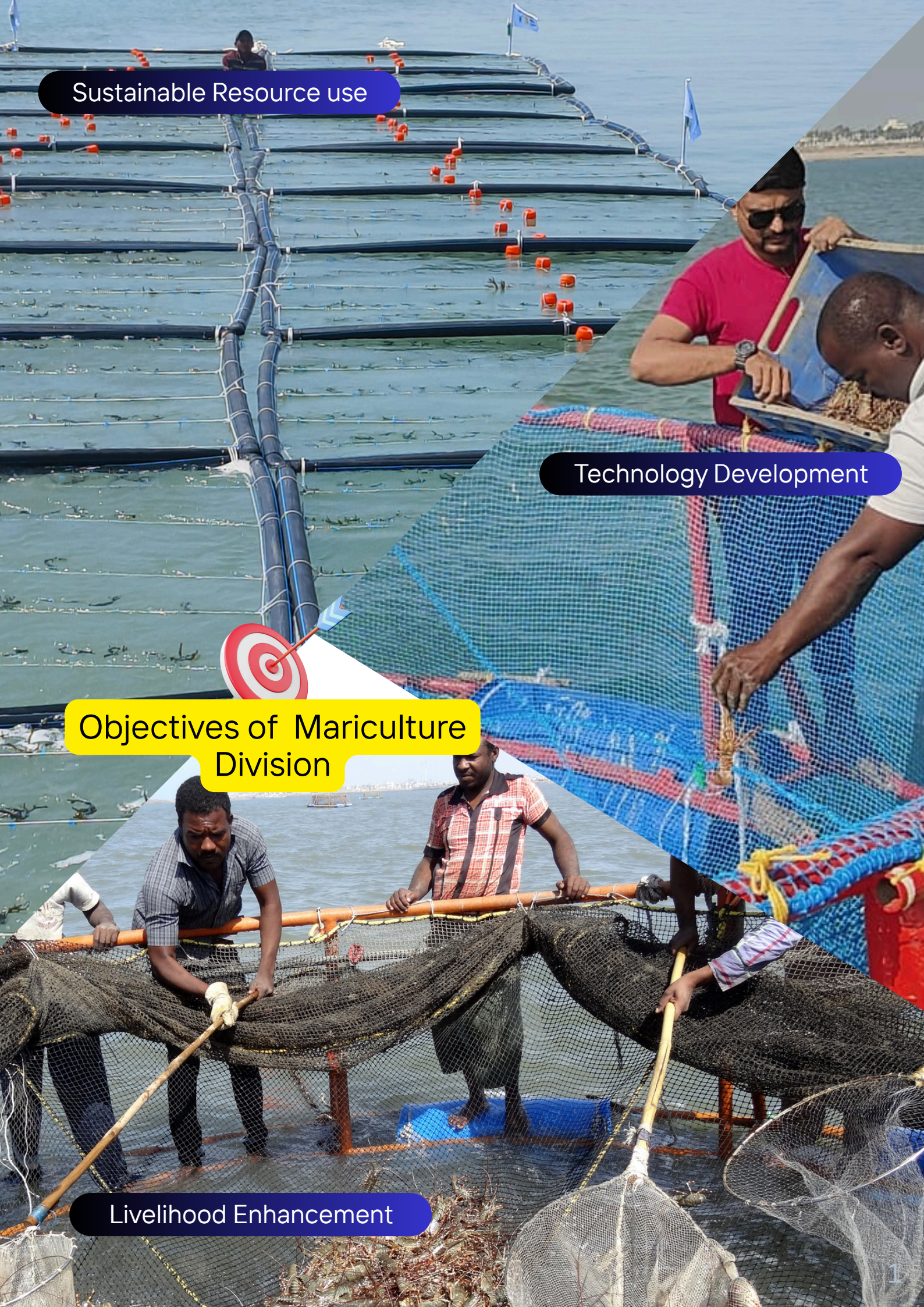
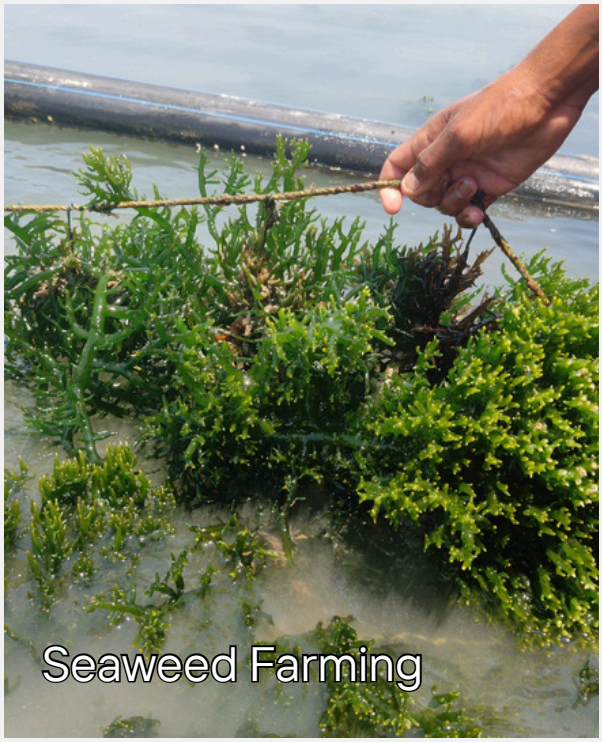

Sustainable Resource use
Technology Development
Objectives of Mariculture Division
Livelihood Enhancement

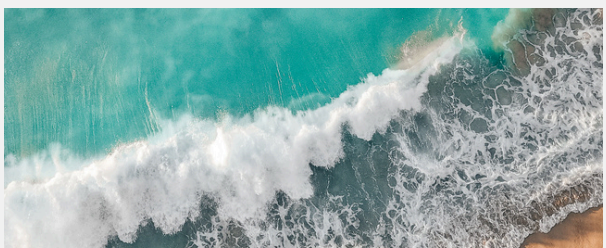
MAJOR ACTIVITIES


Sea Cage Farming


IMTA


Seaweed Farming


Capacity Building



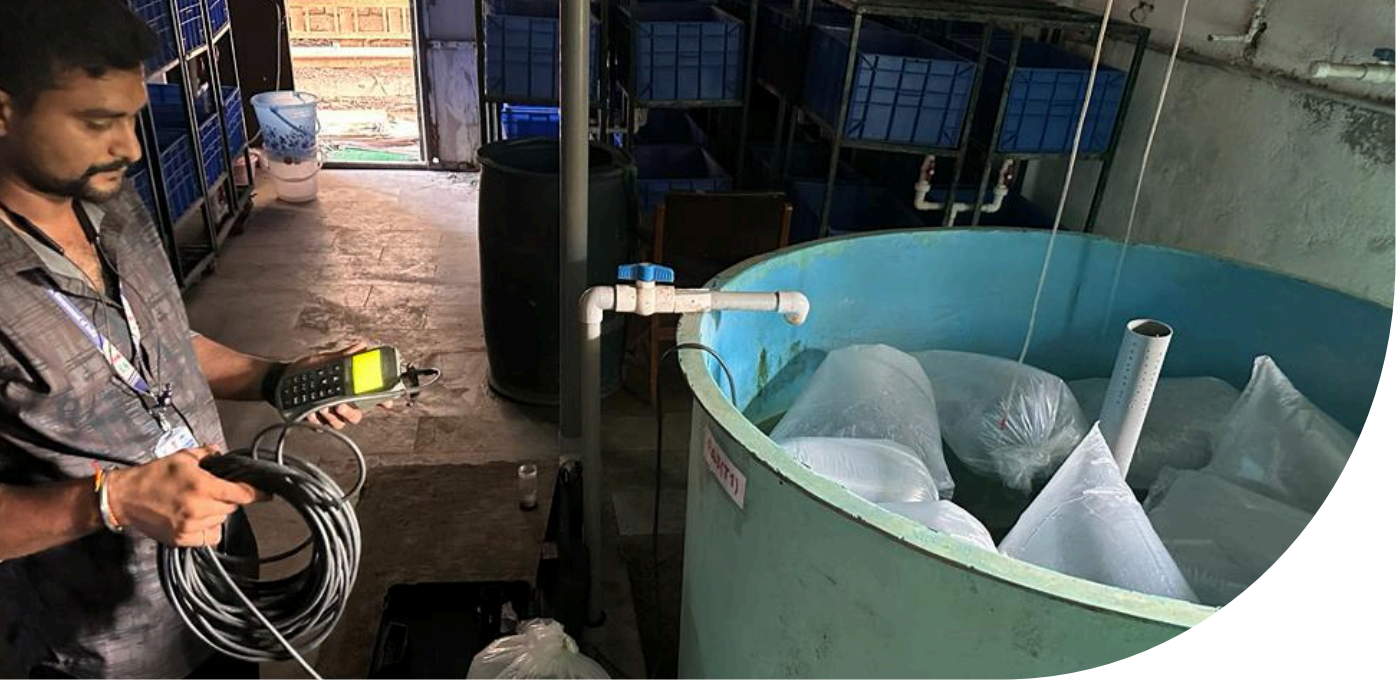
The Mariculture Division of ICAR–CMFRI, Veraval Regional Station, is pioneering a range of sustainable farming initiatives along the Gujarat coast. Key activities include sea cage farming of high-value finfishes such as Asian seabass, cobia and pompano; capture-based cage farming of lobsters to diversify mariculture practices; seaweed farming of commercially important species like *Kappaphycus* and *Gracilaria* with the active participation of registered societies and women self help groups; and Integrated Multi-Trophic Aquaculture (IMTA) combining finfish, shellfish, and seaweeds to maximize resource use efficiency.

Together, these initiatives are enhancing seafood production, creating alternative livelihoods, empowering coastal communities, and contributing to **India's Blue Economy.**

STATE-OF-THE-ART FACILITIES DRIVING MARICULTURE RESEARCH

Facilities at Mariculture Division

To support its cutting-edge research, technology development, and community outreach in mariculture, the Mariculture Division has established a range of specialized facilities at Veraval. These state-of-the-art units serve as the backbone for experiments, innovations, and farmer-oriented demonstrations. They not only accelerate research on marine finfish and shellfish but also provide practical platforms for training, technology transfer, and entrepreneurship development.



Recirculatory Aquaculture System (RAS)

The RAS facility is an innovative indoor rearing system developed to nurture live post-larval finfish such as pompano and other candidate species. With closed-loop water treatment, it offers sustainable and resource-efficient rearing conditions while ensuring year-round seed supply.

Key Features:

- Closed-loop system with biofiltration and aeration for optimal water quality.
- Enables seed production independent of seasonal or coastal limitations.
- Demonstration and training platform for eco-friendly, technology-driven mariculture.

Breakthrough in LOBSTER Farming

With declining wild stocks of lobsters worldwide, mariculture has emerged as a sustainable alternative. At ICAR-CMFRI Veraval, scientists explored innovative farming methods to enhance lobster production while safeguarding natural resources and coastal livelihoods.

FROM WILD CATCH TO SUSTAINABLE CULTURE

EXPERIMENT & APPROACH

A series of rearing trials were conducted, starting from the conventional holding method and gradually moving towards advanced sea cage culture. Each stage added improvements in technology, which directly boosted lobster growth, survival, and feed efficiency. The most advanced culture system proved highly successful, achieving a 5.9-fold increase in production compared to conventional practices.

IMPACT & OUTCOME

Based on the findings, a farmer-friendly Decision-Support System (DSS) was developed. This tool helps optimize stocking density, feeding, culture duration, and harvest timing. The innovation ensures that lobster farming is not only more productive but also profitable, sustainable, and capable of strengthening the livelihood security of coastal fishers.

Thermal Tolerance Studies of Marine Finfish for Climate-Resilient Mariculture

Evaluating Temperature Resilience in *Silver Pompano*

Why Temperature Matters

Temperature is one of the most critical factors for fish farming. It directly affects growth, survival, and overall suitability for aquaculture. With the oceans warming due to climate change, it is vital to identify species that can adapt to fluctuating conditions.

The Experiment

To understand how silver pompano responds to temperature stress, scientists at ICAR–CMFRI Veraval carried out a series of controlled trials. Fish were first acclimated at six different water temperatures, ranging from 18 °C to 36 °C, to mimic real-world seasonal and climate-related changes.
At each acclimation level, the critical thermal maximum (CTmax) and critical thermal minimum (CTmin) were recorded, these represent the upper and lower temperature limits that the fish can tolerate before stress or mortality occurs.

What We Found

Silver pompano proved to be remarkably resilient. They tolerated a wide temperature range, from as low as 12 °C to as high as 41 °C. Fish acclimated at higher temperatures showed greater heat tolerance, demonstrating their adaptability to future warming seas.

Why It Matters

These results confirm silver pompano as a climate-smart species for mariculture. With its ability to thrive under changing conditions, pompano offers opportunities for species diversification, sustainable development, and global food security.

Evaluating Temperature Resilience in *Indian Pompano*

To identify climate-resilient candidates for tropical mariculture, the thermal adaptability of Indian pompano (*Trachinotus mookalee*) was tested at six acclimation temperatures. The Critical Thermal Maxima (CTmax) ranged from 37.02 °C to 43.22 °C, while the Critical Thermal Minima (CTmin) ranged from 12.66 °C to 19.22 °C. For the first time, the Acclimation Response Ratio (ARR) was calculated, demonstrating the species' strong resilience to temperature variations. These results suggest that Indian pompano is a promising candidate for tropical mariculture systems, offering a viable adaptation and mitigation strategy to sustain production under climate change conditions.

Climate-Resilient Finfish for Sustainable Mariculture

Thermal adaptability studies on Silver Pompano (*Trachinotus blochii*) and Indian Pompano (*Trachinotus mookalee*) reveal their strong potential as climate-resilient candidates for tropical mariculture. Both species demonstrated remarkable tolerance to a wide range of temperatures, with Silver Pompano thriving between 12 °C and 41.1 °C and Indian Pompano between 12.66 °C and 43.22 °C. These experiments, including the first calculation of the Acclimation Response Ratio (ARR) for Indian Pompano, highlight the species' ability to adapt to fluctuating environmental conditions. Such insights provide critical guidance for selecting finfish that can sustain production under the impacts of climate change, supporting the development of resilient, sustainable, and diversified mariculture systems in tropical coastal regions.

TECHNO-ECONOMIC

INSIGHTS INTO ASIAN SEABASS CAGE FARMING

THE RISING STAR OF MARICULTURE

Asian seabass (*Lates calcarifer*) has become one of the most sought-after species for cage farming in Indian waters. Its adaptability to farming systems, availability of seeds, and suitable sites along the coast make it a natural choice for expanding mariculture ventures.

Although seabass cage farming is expanding in India, the absence of comprehensive techno-economic studies has slowed its growth. To address this, **ICAR–CMFRI Veraval Regional Station** developed a Decision-Support Model (DSM) using validated field data and scenario simulations. This model helps farmers and investors understand costs, production benchmarks, and market dynamics, enabling informed decisions and reducing risks.

Integrates biological, technological & financial factors

OUTCOMES

- Break-even achievable at 31% Capacity Utilization (CU)
- Sustained profitability projected over 10 years
- Lower risk through integration of biological, technological & financial factors
- Provides a reliable tool for farmers and investors to plan effectively
- Demonstrates seabass as a profitable and scalable candidate for mariculture

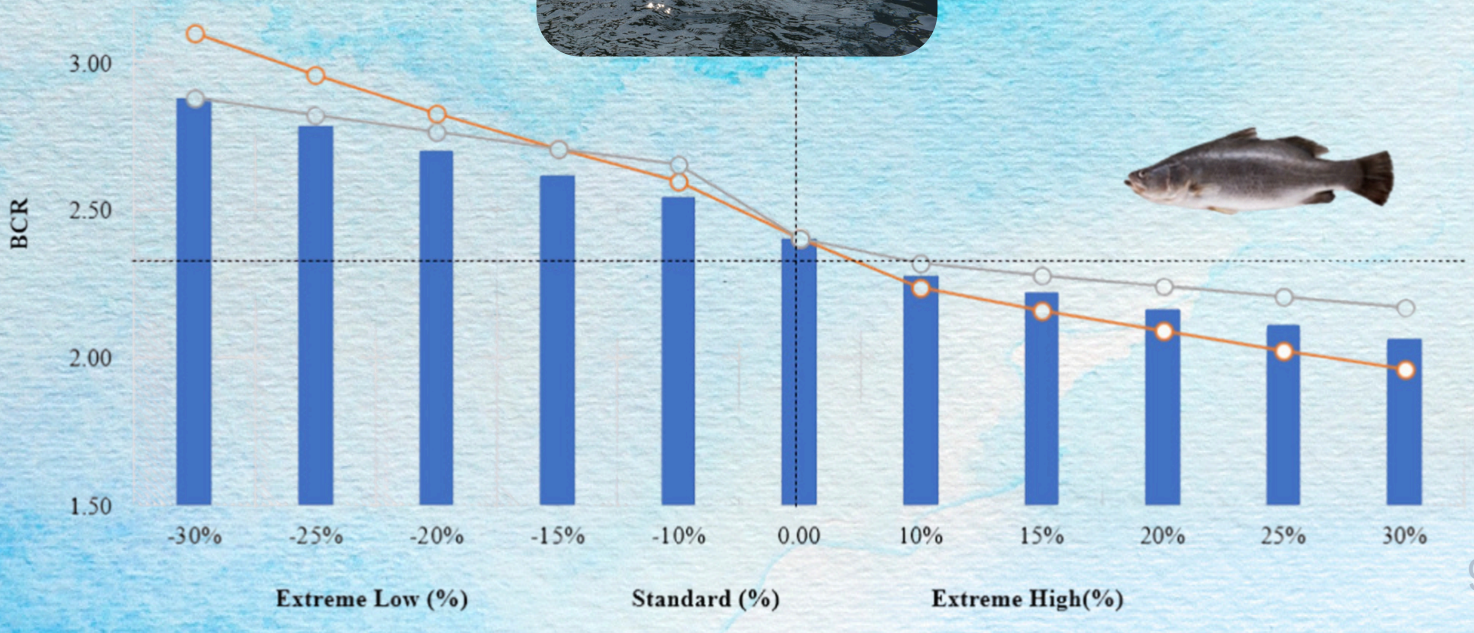
"Seabass Farming Made Sustainable"

Research on

Feed & Seed Costs

Adapting Seabass Farming to a Changing Climate

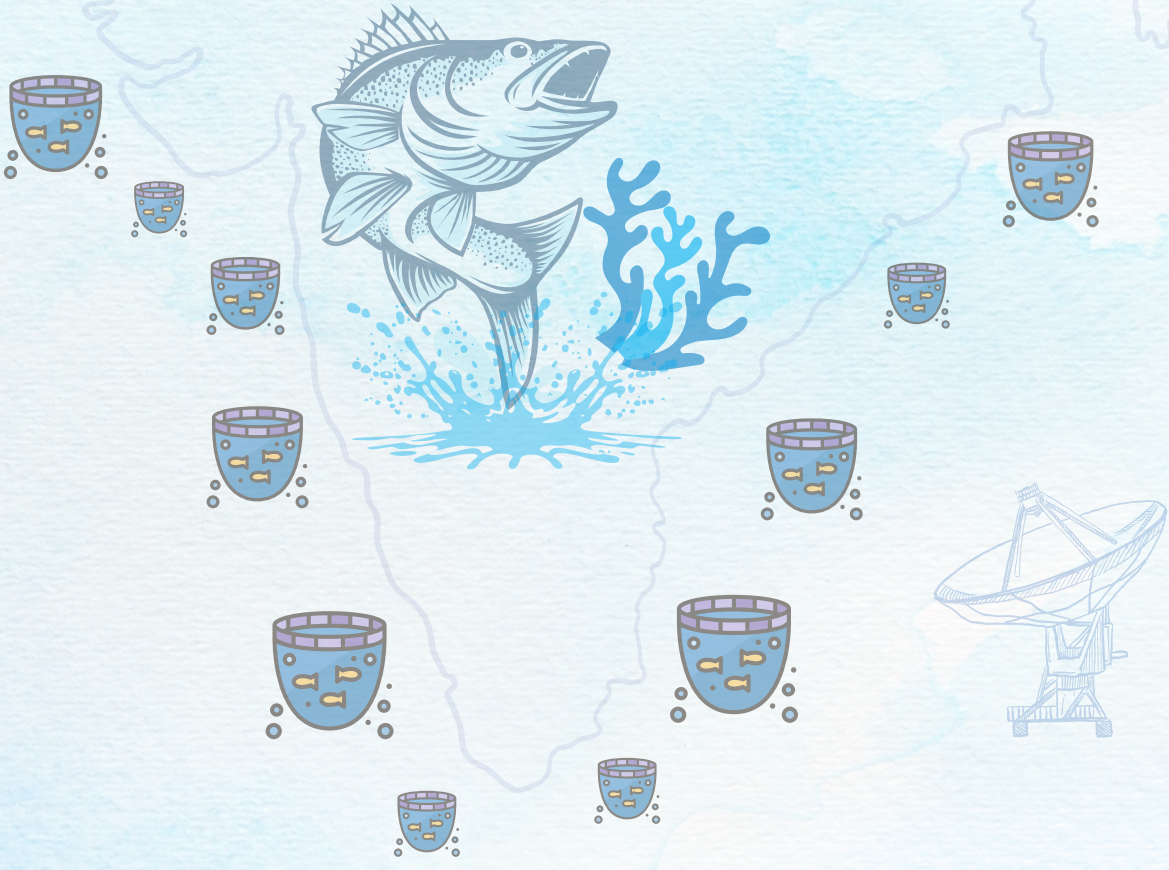
Rising feed and seed costs are a major challenge in seabass cage farming, affecting profitability and sustainability. To address this, **ICAR–CMFRI Veraval Regional Station** analyzed ten years of farming data, finding that total sales revenue reached US $100,848 with a net profit of US $55,198.89 under normal conditions. A 30% increase in feed and seed prices significantly altered economics, raising break-even points by 8.8–9.2% and reducing the Benefit–Cost Ratio by 10–18%, highlighting the sensitivity of the enterprise to these inputs. The study emphasizes the importance of formulated feeds and efficiency improvements to ensure profitable and sustainable seabass cage farming.



Mapping Potential MARICULTURE Sites

Spatial Planning for Sustainable Mariculture

Optimizing Coastal and Open-Sea Spaces for Responsible Growth



RESEARCH HIGHLIGHTS

NATIONAL-SCALE MAPPING

Using GIS-based spatial modeling, potential sites within 3 km of the coastline were identified for marine cage culture across India. A total of 134 sites covering 46,958.2 ha were demarcated as suitable. Andhra Pradesh (11,792 ha), Gujarat (11,572.2 ha), and Tamil Nadu (7,673 ha) were found to have the largest potential.

GUJARAT CASE STUDY

A detailed GIS-Multi Criteria Evaluation (MCE) model was developed for Gujarat's territorial waters (23949.33 km²). The model incorporated biological, oceanographic, and socio-infrastructural factors. It identified 12,557.74 km² (52.43% of total) suitable for mariculture, with 27.43% highly suitable and 25% moderately suitable, highlighting untapped potential.

MODEL BENEFITS

The framework provides a systematic, adaptable decision-support tool for all maritime states. It helps stakeholders and policymakers make informed, sustainable choices for mariculture expansion while minimizing ecological and spatial conflicts.

Intercropping Approaches in Mariculture

Silver Pompano in Shrimp Ponds

Shrimp farming is one of the most important aquaculture activities in India, but farmers often face fallow periods between shrimp production cycles, leaving large pond areas idle. These unused intervals reduce productivity and income, creating uncertainty for farming communities. Diversification through finfish integration provides a way to make better use of existing infrastructure, enhance food security, and stabilize livelihoods.

Silver pompano (Trachinotus blochii), a hardy and fast-growing marine finfish, emerged as a strong candidate for intercropping in shrimp ponds. Its proven adaptability, consumer demand, and compatibility with shrimp farming practices make it a climate-resilient and farmer-friendly species for sustainable aquaculture diversification.

The Experiment

Silver pompano (Trachinotus blochii) was successfully intercropped with Pacific white shrimp (Litopenaeus vannamei) in coastal shrimp ponds under a participatory research model. Over a 100-day culture period, pompano displayed:

- Growth from 40 g → 256 g (average harvest size ~250 g)
- Survival rate of ~90%
- Feed conversion ratio (FCR) of 1.94

The Outcome

- Projected yield: 16.2 tonnes/cycle from 4500 m^2 water spread area
- Benefit-Cost Ratio (BCR): 1.34
- Proven adaptability of pompano to land-based shrimp pond systems

From Research to Community Impact

Following the successful trials on intercropping silver pompano with Pacific white shrimp in coastal ponds, ICAR-CMFRI took the next step bringing the technology to fishing communities under the Scheduled Caste Sub-Plan (SCSP). The focus was not only on scientific validation, but on ensuring the usage of unused shrimp ponds during fallow/winter periods could generate income and livelihood opportunities for coastal families as inter/winter cropping.

Through a Farmer School model, selected beneficiaries were trained as Master Trainers in mariculture practices. These trainers now act as resource persons, ensuring knowledge reaches a wider network of fishermen across Gujarat.

Five entrepreneurs signed MoUs with CMFRI to adopt shrimp–finfish intercropping. Training and demonstrations were carried out in Veraval, Porbandar, Mangrol, Diu, Okha, and Valsad.

Celebrating Success

The programme culminated in a Harvest Mela, where farmers showcased their crops of shrimp and pompano, proving the model's economic viability and social impact.

SEAWEED RESEARCH & CULTIVATION INNOVATIONS

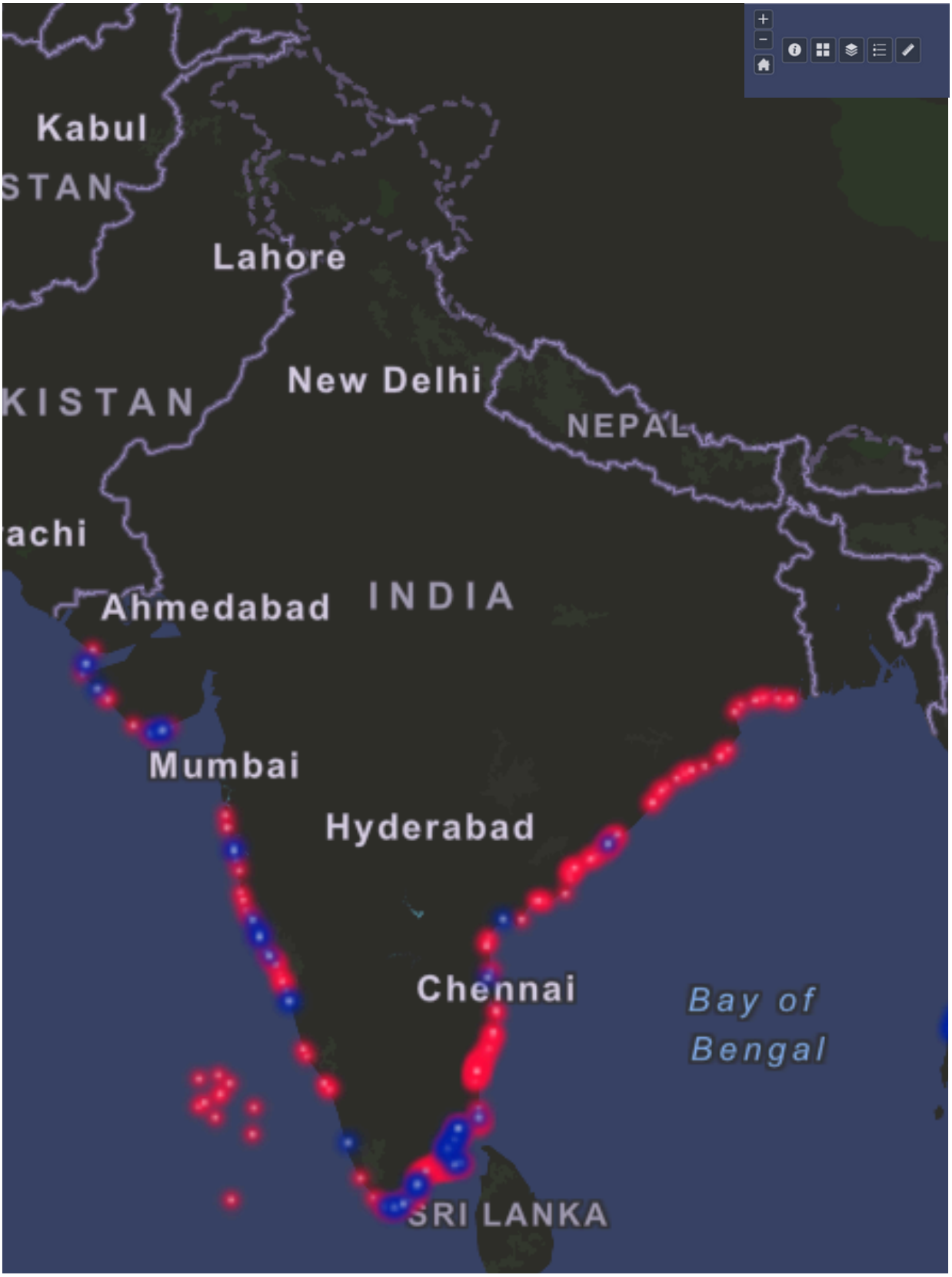
The Veraval Mariculture Division has pioneered sustainable seaweed cultivation practices along the Indian coast. Research emphasizes developing robust and scalable techniques suitable for diverse marine environments, including rough seas.

- HDPE Raft/Grid System: Innovative design for stable seaweed growth in rough sea conditions.
- Net, Tube, and Monoline Methods: Optimization of traditional and modern cultivation techniques for higher yield.
- Species-specific practices: Tailored methods for commercially important seaweed species.
- Scalable offshore cultivation: Techniques designed for expansion in open water farms.
- Farmer engagement & training: Capacity-building programs to enable coastal communities to adopt modern seaweed cultivation systems.

Advancing Seaweed Cultivation

Collaborative Development and Innovative Practices Along the Indo-Pak Coastline.

In collaboration with **NITI Aayog**, an ***interactive ArcGIS web application*** has been developed to highlight suitable sites for seaweed mariculture along the entire Indian coast, including Union Territories. This platform enables stakeholders to explore and plan sustainable seaweed farming locations efficiently.



gisportal.ncscm.res.in

POLICY SUPPORT

In addition to the interactive seaweed farming platform, the Veraval Mariculture Division has played a pivotal role in shaping the national mariculture roadmap. The division actively contributed to the preparation of a comprehensive Mariculture Policy Document for NITI Aayog, providing critical inputs for sustainable growth and strategic planning of the sector across the Indian coast. Furthermore, expert insights were also shared towards the CAA Amendment Bill 2023, ensuring that policy frameworks align with scientific innovations and community-centric development in mariculture.

सत्यमेव जयते
NITI Aayog

तटीय जलकृषि प्राधिकरण
COASTAL AQUACULTURE AUTHORITY

Patents & Publications

By ICAR-CMFRI, Veraval Regional Station
Mariculture Division

TECHNOLOGIES

4

15

A significant number of IP patents and innovative integration concepts generated

2 Industrial Design

8 Methods

1 SoP

4 Device Design cum Process/ Method

4 Novel Decision-advisory Forecast Models published in International Transformative Journals

21 high-impact international peer reviewed publications

8 Science Communication Contributions in Developing Digital Documentaries on Mariculture Technologies, Community Oriented Farming & Decision Advisories

The Mariculture Division of ICAR-CMFRI Veraval RS has made notable contributions to Indian mariculture with 2 ICAR-released technologies, 15 patent filings (including granted patents), and over 20 high-impact research papers. Alongside, the division has produced books, translations, digital documentaries, and training modules, ensuring that innovations reach stakeholders at every level. These achievements reflect a balanced focus on scientific excellence, technology development, and community outreach for sustainable mariculture growth.

INTELLECTUAL PROPERTY INDIA
PATENTS | DESIGNS | TRADE MARKS
GEOGRAPHICAL INDICATIONS

Innovations
for Sustainable Mariculture

INTELLECTUAL PROPERTIES DEVELOPED

A Copepod Nauplii Accumulating and Harvesting Device
Anikuttan K. K., Tamilmani G., Vinod K., Sakthiveli, M., Rameshkumar, P., Divu Damodaran Nair, Suresh Kumar Mojjada., Swathi Lekshmi P S., Suresh, V. V. R., Achamveettil, Gopalakrishnan.
Patent No. 421026-001 | Granted 2024

Cage for Lobster
Divu D., Mojjada S.K., Koya K., Gopalakrishnan A.
Patent No. 329962-001 | Granted 2020

A Microbubble Diffusing Aeration Apparatus in Mariculture Pond
Divu D., Bachubhai R.V., Mojjada S.K., et al.
App. No. 202111052892 | Filed 2021

A Method for Culturing Pearl Oyster Species & Production of Mabe Pearl
Anil M. K., Gomathi P., Gopidas A.P., Sumathy S., Bhargavan R., Ronald M.R., Divu D., Mojjada S.K., Gopalakrishnan A.
App. No. 202111044313 | Filed 2021

An Apparatus & Method for Gravity Flow Regulated Recirculatory Mariculture System
Anil M.K., Gomathi P., Divu D., Mojjada S.K., et al.
App. No. 202111044314 | Filed 2021

A Closed Aquaculture System Using Upwelling Flow for Molluscs
Anil M.K., Gomathi P., Divu D., Mojjada S.K., et al.
App. No. 202111044315 | Filed 2021

A Compacted Dampish Air Permeability Transportation Method of Seaweeds
Jayasankar R., Divu D., Thirumalaiselvan S., Mojjada S.K., et al.
App. No. 202111044316 | Filed 2021

A System & Sustainable Improved Method for Integrated Culturing Marine Finfish in Shrimp System
Divu D., Mojjada S.K., Ignatius B., Gopalakrishnan A.
App. No. 202111005292 | Filed 2021

An Apparatus & Recirculatory Aquaculture Method for Post-Larval Marine Finfish
Divu D., Mojjada S.K., Gopalakrishnan A.
App. No. 202111005291 | Filed 2021

Long-Distance Transportation of Live Post-Larval Marine Finfish (Silver Pompano)
Divu D., Mojjada S.K., Gopalakrishnan A.
App. No. 202111005290 | Filed 2021

Living Juvenile Lobster Transportation Method & Apparatus
Divu D., Mojjada S.K., Dash G., Gopalakrishnan A.
App. No. 202011053449 | Filed 2020

Marine Culturing Method for Enhanced Growth of Mud Spiny Lobster in Net Cages
Divu D., Mojjada S.K., Koya K., Gopalakrishnan A.
App. No. 202011042791 | Filed 2020

A Fully Automated Recirculatory Aquaculture System with Cloud-Based Monitoring
Mojjada R.K., Gopalakrishnan A., Divu D.N., et al.
App. No. 202141045604 | Filed 2021

A Device for Breeding & Culturing Marine Fish in Open Sea
Syda Rao G., Gopakumar G., Suresh Kumar M., et al.
Patent No. 322166 | Granted 2019

ICAR

INDIAN COUNCIL OF AGRICULTURAL RESEARCH

Certified that

Dr B Johnson
(Lead Developer)

Associate Developers
Dr G Tamilmani, Dr M Sakthivel
Dr P Ramesh Kumar, Dr K K Anikuttan
Mr M Sankar, Dr Divu D, Dr S K Mojjada
Dr S Ghosh, Dr Sekar M, Dr P Shinoj
Dr R Jayakumar, Dr A K Nazar, Dr George G
Dr B Ignatius, Dr A Gopalakrishnan

of

ICAR-CMFRI, Kochi

has developed the technology

Integrated Multi-Trophic Aquaculture (IMTA) of seaweed and fish farming in cages

16th July, 2024
New Delhi

(Shubhadeep Ghosh)
Assistant Director General (M.FY.)

(J.K. Jena)
Deputy Director General (Fisheries Science)

ICAR-FS-CMFRI-Product-2023-032

ICAR

INDIAN COUNCIL OF AGRICULTURAL RESEARCH

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Associate Developers
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Dr Boby Ignatius, Dr A Gopalakrishnan

of

ICAR-Central Marine Fisheries Research Institute (CMFRI)
Kochi, Kerala

has developed the technology

A spatial data-driven digital layer product for site suitability distribution for seaweed farming: Product

16th July, 2023
New Delhi

(Shubhadeep Ghosh)
Assistant Director General (M.FY.)

(J.K. Jena)
Deputy Director General (Fisheries Science)

ICAR-FS-CMFRI-Product-2024-023

ICAR

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Associate Developers
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Dr L Ranjith, Dr P P Suresh Babu
Dr M Koya, Dr S Ghosh, Dr P Rohit
Dr B Ignatius, Dr A Gopalakrishnan and team

of

ICAR-CMFRI, Kochi

has developed the technology

ArcGIS Web Application: An interactive seaweed farming sites along Indian Coast

16th July, 2024
New Delhi

(Shubhadeep Ghosh)
Assistant Director General (M.FY.)

(J.K. Jena)
Deputy Director General (Fisheries Science)

ICAR-FS-CMFRI-Methodology-2024-025

ICAR

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Dr S Padua, Dr N Aswathy, Dr S Ghosh, Dr D Divu
Dr Sekar M, Dr A P Gop, Dr R Geetha, Dr S V Vinuja
Dr B Ignatius, Dr V V R Suresh, Dr B Santhosh
Dr R Narayanakumar, Dr Prem Chand and
Dr A Gopalakrishnan

of

ICAR-CMFRI, Kochi

has developed the technology

A framework for assessing the level of sustainability in mariculture

16th July, 2024
New Delhi

(Shubhadeep Ghosh)
Assistant Director General (M.FY.)

(J.K. Jena)
Deputy Director General (Fisheries Science)

Outreach

Media

THE HINDU

CMFRI: Fishermen can harvest 3.2 tonnes of seaweed a year

STRATEGIC PROJECT

- The first such project taken up on sensitive Indo-Pak border
- Highly advanced technology used to counter rough sea conditions
- The project aims to make the border more secure, increase fishermen's income
- People in 24 coastal villages of Kutch to benefit
- 240 special rafts to be installed for growing seaweed
- One raft has a lifespan of 20 years
- Fishermen can take 8 harvests (3,200kg) of seaweed a year

▶Continued from P1

The Central Marine Fisheries Research Institute (CMFRI), Veraval, the nodal agency, which is implementing this project along with the Border Security Force (BSF), has adopted advanced mariculture technology that can be used in extremely challenging tidal conditions near Padala and Kori creeks.

Suresh Kumar, the nodal officer of this project, told TOI, "This area has India's highest tidal amplitude. We have developed advanced HDPE raft-based seaweed farming technology for this region and successfully experimented it. The specialty of this raft is its adaptability to the extreme ocean weather changes."

The CMFRI is planning to install a total of 240 specialized rafts at the strategic locations including Kori and Padala marine waters and 24 other villages of three talukas in Kutch.

"This advanced mariculture technology demonstrated exceptional performance even in the roughest tidal weather conditions," said Kumar

"One raft costs Rs 16,000 with a lifespan of 20 years. Fishermen farming techniques.

Following the successful seaweed farming experiment, a strategy for commercial production and making the project economically viable for the coastal community was drafted and presented to the PMO.

Seaweed has a slew of applications in cosmetics, animal food, human food, fertilizer, industrial gums, chemicals, etc.

Also, the project is in line with the Seaweed Mission launched in 2021.

According to the government estimates, if seaweed cultivation is done in 10 million hectares or 5% of the exclusive economic zone (EEZ) area of India, it can generate employment for nearly 50 million people by increasing the production from 30,000 tonnes per annum to 11 million tonnes by 2025.

Divu D, senior scientist and principal investigator of the project said, "This project is of India's highest priority strategically. The project aims to harness the vast potential of seaweed farming in these strategic and unexplored locations. It promises economic growth, job creation, and the equitable empowerment of coastal communities where other means of livelihood are limited."

CITY 17, May 2012 3

Hope floats for depleting spiny lobster production

Scientists Conduct First Open Sea Farming Experiment

TIMES NEWS NETWORK

Rajkot: In an important development for the fishing community of Gujarat, the Central Marine Fisheries Research Institute (CMFRI), a constituent organization of the Indian Council of Agricultural Research, New Delhi, successfully conducted a field demonstration trial of the open sea farming of spiny lobster.

The farming was demonstrated on Wednesday in the open sea research cage farm established off Veraval in Junagadh district.

According to K Mohammed Koya, scientist, CMFRI (Veraval Station), the lobster, popularly known as 'Dantar', in Gujarat is one of cages of 6 metre diameter and 4 metre net depth in the first week of February. After the grow-out period of nearly 110 days, the lobsters reached an average size of 310 g with a growth increment approximately 1.36 g per day with nearly 88.7% survival. The total harvest weighed 272 kg of three different size grades fetching a total of nearly Rs 2.40 lakh at the local prices," he added.

Scientists say that the success of the field trial will brings relief to the coastal population especially the fishermen community from the decreasing catch and skyrocketing input costs.

"The state administration has immense potential

Open sea farming being demonstrated in Veraval

THE HINDU businessline

CMFRI proposes mariculture parks to boost coastal fish production

V Sajeev Kumar
Kochi

The ICAR-Central Marine Fisheries Research Institute (CMFRI) has proposed the establishment of mariculture parks to enhance coastal fish production of the country, in view of the growing food and nutritional demand anticipated in the coming years.

This proposal was presented at a discussion on aquaculture and fisheries-based transformation of food systems held at the 16th Agricultural Science Congress (ASC) here.

According to CMFRI, such parks can be set up in the coastal districts where suitable sites have been identified for various mariculture activities, including marine cage fish farming and seaweed farming. CMFRI has identified 46,823.2 hectares of suitable sites for marine cage fish farming along Indian territorial waters and 333 prospective seaweed farming sites covering 23,950 hectares.

Scientists hold the view that the parks will help to avoid the scattered and unplanned expansion of sea farming, which can lead to disruption of the ecosystem, user conflicts, and other social issues.

SUSTAINABLE ECONOMY

"Establishing mariculture technology parks in the Indian territorial waters would pave the path for a sustainable blue economy by integrating indigenous mariculture technologies and fortifying the blue growth strategy envisaged by the Prime Minister," said the CMFRI paper by Suresh Kumar Mojjada.

The session also highlighted that creation of climate adaptation plans integrating with fisheries management is required.

THE TIMES OF INDIA

THE TIMES OF INDIA

Kutch aims to harvest 1L tonnes of seaweed a year

Nimesh.Khakhariya
@timesgroup.com

ALTERNATIVE LIVELIHOOD

- The project being implemented at Kori Creek and Padala Creek aims to harvest 25,000 tons a year starting 2025-26
- Modern rafts given to fishermen are resistant to extreme tidal conditions
- Each fisherman can harvest around 3,000kg of seaweed per year
- A total of 240 rafts will be given to the fishermen as the project progresses
- The aim is to scale up the production to one lakh tonnes per year
- India's current seaweed cultivation is 65,000 tonnes per year
- The project is aimed at creating alternative livelihoods for fishermen in this region

Rajkot: The coastal region near the Indo-Pak border in Kutch is expected to produce a significant quantity of seaweed in the near future.

The seaweed production project at Kori and Padala creeks, undertaken by ICAR-CMFRI (Central Marine Fisheries Research Institute), is set to commence harvesting in the financial year 2025-26, with a target of 25,000 tons per year.

PK Mishra, the principal secretary to the Prime Minister, visited the cultivation site on April 30 to assess the progress of the project, which is considered to be of strategic importance and planned at the sensitive border area to uplift the livelihood of people living in border villages.

Suresh Kumar Mojjada, the nodal officer of the project, told TOI: "We are planning to harvest 25,000 tons of seaweed per year in this region and scale it up to one lakh tonnes per year. The current production of seaweed in India is around 65,000 tons. We are also developing a seed bank for the benefit of seaweed farmers."

The project aims to improve the lives of fishermen living in the villages near the creek by supplementing their income and enhancing the security of this sensitive border area. The central agency implementing this project has employed advanced mariculture technology that can be utilized in the extremely challenging tidal conditions near Padala and Kori creeks.

The agency has developed advanced HDPE raft based seaweed farm technology and successfully tested its adaptability to extreme ocean weather changes.

"The project has introduced custom-made HDPE rafts, dedicated to cultivating the resilient seaweed species kappaphycus alvarezii. Each raft, valued at Rs 16,000, has a lifespan of 20 years," Mojjada added.

Currently, Tamil Nadu is the highest seaweed producing state in India, but according to scientists, the conventional method is used for cultivation there.

"The grid technology heralds a new era of efficiency, surpassing conventional methods employed in states like Tamil Nadu. Its capacity to withstand weights up to 0.3 to 0.5 tons per raft and yield an impressive 300 to 400 kg per raft," said Divu D, senior scientist and principal investigator of the project.

A fisherman can take eight harvests per year, which is around 3,000 to 3,500 kg per year.

The Central Marine Fisheries Research Institute (CMFRI) plans to install a total of 240 specialized rafts at strategic locations, including Kori and Padala marine waters and 24 other villages of three talukas in Kutch.

Seaweed to usher in sea change near sensitive Indo-Pak border in Kutch

Project Set To Help Improve Security & Fishermen's Income

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Rajkot: Sir Creek, the 96 km tidal estuary infamous for repeated Pakistan boat incursions in Kutch, and nearby areas close to the sensitive international border are set to undergo a sea change.

Seaweed farming has been successfully initiated in this sensitive area of Kutch despite geographical and marine challenges. This has been accorded status of 'highest priority national strategic project along India Pak waters'.

The project is aimed at uplifting lives of fishermen living in villages near the creek by supplementing their income and making this sensitive border area more secure.

The project is being implemented by Central Marine Fisheries Research Institute and the BSF

▶Continued on P 6

દિવ્ય ભાસ્કર

માસ્ટર ટ્રેઇનરની તાલીમ મેળવશે | ખેડૂતો, મહિલાઓ આ તાલીમથી પોતાની આજીવિકા સ્વાવી શકશે

વેરાવળનાં 2 યંગ પ્રોફેશનલની આગેવાની હેઠળ કચ્છનાં 5 ખેડૂત શેવાળની ખેતીની તાલીમ માટે તામિલનાડુના પ્રવાસે

કચ્છમિત્ર

સમુદ્રી શેવાળ કચ્છી મહિલાઓની આર્થિક સમૃદ્ધિનું બનશે માધ્યમ

മത്സ്യോൽപാദനം കൂട്ടാൻ മാരികൾച്ചർ പാർക്കുകൾ വേണം സിഎംഎഫ്ആർഐ

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23 April 2024, at 11:00am

Strategic seaweed farms impress Indian officials

During a visit to seaweed farms developed along the India-Pakistan border, Principal Secretary Dr P. K. Mishra expressed keen interest in the operation and its socio-economic implications for the region.

Principal Secretary Dr P. K. Mishra was impressed by the products of the seaweed farms © ICAR-CMFRI

Department of Fisheries India
18h ·

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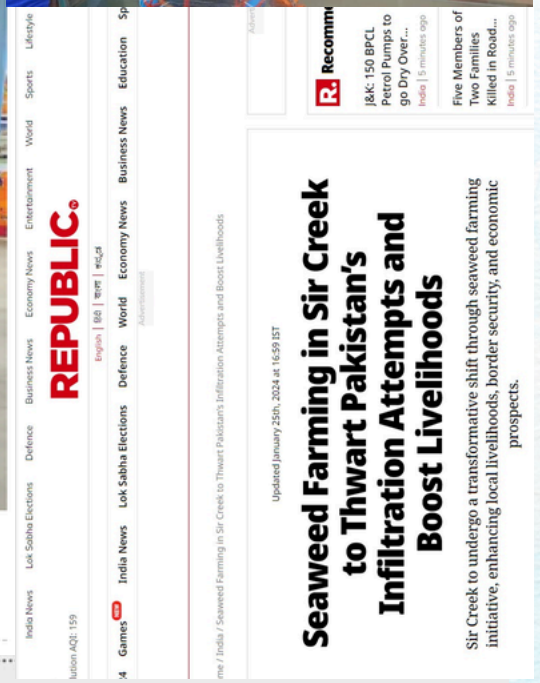
REPUBLIC.

Seaweed Farming in Sir Creek to Thwart Pakistan's Infiltration Attempts and Boost Livelihoods

Updated January 25th, 2024 at 16:59 IST

Sir Creek to undergo a transformative shift through seaweed farming initiative, enhancing local livelihoods, border security, and economic prospects.

Siddi people to be 'blue economy' entrepreneurs

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Rajkot: The Siddi community — people of African origin settled in Gir Somnath district who have traditionally been engaged in labour or seafaring — are set to become the face of India's "blue economy".

The central govt's Central Marine Fisheries Research Institute (ICAR-CMFRI) is setting up India's first dedicated Mariculture Science and Technology Innovation (STI) Hub in Veraval town, specifically for the Siddi community. It aims to transform them into entrepreneurs through training in mariculture. The initiative is supported by the department of science and technology (DST).

A large number of Siddi people live in Jambur village of Talala taluka, with several families scattered across various other villages of the district. Gujarat has more than 30,000 people of this community.


TOI

A group of Siddi workers receiving mariculture training

They have lived in this region for centuries and possess great physical strength and endurance, but remain economically marginalized and face significant challenges such as unemployment, lack of access to technology and many of them live in poverty.

According to CMFRI, the skills of the Siddi community are not fully utilized due to the lack of technical knowledge, resources and the support required for integrating modern livelihood solutions.

"The community needs support to ensure they can fully realize their potential in mariculture. The lack of access to advanced technologies, technical support and resources hampers their ability to scale these initiatives into sustainable and profitable businesses," said Suresh Kumar Mojjada, co-principal investigator of the DST-STI-Hub.

Divu D, senior principal investigator and chairman of the hub, said, "This innovative hub aims to bridge the knowledge and resource gap by providing this community access to the latest in mariculture technologies. The hub is designed to foster entrepreneurship by training and exposure to modern mariculture practices."

Hasam Musangara, a Siddi leader, said, "This hub will prove significant for the upliftment of our community. We are asking people to get training and improve their livelihood. The income of those who proceed in mariculture will increase and they will come out of poverty."

What the training will entail

A group from the Siddi community will be trained in integrated multi-trophic aquaculture (IMTA), sea cage farming and seaweed farming, to make them entrepreneurs. IMTA is a method in which multiple aquatic species are raised together. "There will be an industry pitching centre in our hub. We will pitch these people's capabilities to investors and will organize this event once a year. We will also transfer technology along with knowledge and expertise. We will form a company for this community in which they will be the directors and will be able to deal with investors. We plan to develop an industry in mariculture, which is being experimented with for the first time in India with this community at Veraval," Mojjada said.


Design Concepts for
Mariculture Systems


ADVANCED SEAWEED RAFTS DEPLOYMENT, COMMISSIONING, MOU EXCHANGE AND
TECHNOLOGY TRANSFER TO STAKEHOLDERS OF KUTCH
&
HANDS-ON TRAINING CUM EXPOSURE PROGRAM
Under the Highest priority strategic project on seaweed farming along
Indo-Pak border marine creeks and selected locations of Kutch
Date: 06/03/2025
Place: KOTTI CREEK, LAKET
Noola
CMFRI
Indian Council of Agricultural Research
Central Marine Fisheries Research Institute
Mandapam Regional Station, Gujarat
Dept. of Fisheries, Govt. of India and Monitored
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