भारत सरकार
GOVERNMENT OF INDIA
मत्स्यपालन विभाग
Department of Fisheries

FISHTech Report

"To Explore Technologies in Fisheries and Aquaculture Sector"

20 26 JULY

MANAGE Fisheries Innovation and Startup Hub (MANAGE - FISHub)

(A National Fisheries Incubation Centre Supported by the Ministry of Fisheries, Animal Husbandry and Dairying, Govt. of India)

National Institute of Agricultural Extension Management (MANAGE)

(An Autonomous Organization of Ministry of Agriculture and Farmers Welfare, Govt. of India)

Rajendranagar, Hyderabad – 500 030, Telangana, India

https://www.manage.gov.in/managefishub/

MANAGE-FISHub

MANAGE – Fisheries Innovation and Startup Hub (MANAGE-FISHub) is a national-level incubation and innovation hub hosted at the National Institute of Agricultural Extension Management (MANAGE). It was established at MANAGE in 2025 with the support of the Department of Fisheries (DoF), Ministry of Fisheries, Animal Husbandry and Dairying (MoFAHD), Government of India, to transform the fisheries and aquaculture sector through innovative technology, entrepreneurship, and ecosystem development.

Vision

The Vision of MANAGE-FISHub is to foster sustainable innovation and entrepreneurship in the fisheries and aquaculture sector by nurturing startups, accelerating technology adoption, and promoting inclusive growth across the value chain.

Collaboration Partner

ICAR–Central Marine Fisheries Research Institute (ICAR–CMFRI)

The ICAR–Central Marine Fisheries Research Institute (ICAR–CMFRI) played a central role by collaborating with MANAGE-FISHub for the FISHTech Webinar Series.

Established on 3 February 1947, the ICAR–Central Marine Fisheries Research Institute (ICAR–CMFRI), headquartered in Kochi, Kerala, is one of the world's leading tropical marine fisheries research institutes under the Indian Council of Agricultural Research (ICAR). Renowned for its excellence in marine fisheries, mariculture, biotechnology, and coastal ecosystem research, ICAR-CMFRI develops innovative technologies, scientific knowledge, and skilled human resources to promote the sustainable growth and resilience of India's marine fisheries and aquaculture sector.

FISHTech Webinar

FISHTech Webinar series is a flagship online knowledge-sharing initiative of MANAGE–FISHub, designed to showcase innovative technologies developed by fisheries research institutions, ICAR institutes, State Fisheries Universities, and other academic and R&D organizations across India. The series aims to bridge the gap between technology developers and end users by creating a structured national platform for technology dissemination.

Objective of the Webinar

- To disseminate knowledge on emerging fisheries technology developed by fisheries institutes.
- To facilitate technology awareness among budding aquapreneurs, innovators, rural youth, students and fisheries professionals.
- To showcase commercialization pathways and startup opportunities linked with institution-developed fisheries technology
- To strengthen capacity building through expert-led sessions.
- To facilitate interaction among scientists, startups, aspiring aquapreneurs and students, thereby fostering collaborative learning and innovation ecosystems.

Program Schedule

The MANAGE-FISHub Webinar Series was organized as a structured 15-day intensive program, with each day dedicated to covered cutting-edge technologies and emerging trends within the fisheries sector.

INAUGURAL SESSION
Setting the context for the topics

TECHNICAL PRESENTATION
Detailed lecture by a subject matter expert from ICAR-CMFRI

Q & A SESSION
Interactive Forum for participants queries

Promotional Activities

The outreach focused on both institutional and public digital platforms

Regular updates and speaker profiles shared across social media handles

Short coming soon posters were used to redirect the participants

A key collaborating partner, **CMFRI** promoted the series through their internal WhatsApp Group

Information brochures and daily session links were shared through all WhatsApp groups

Formal invitation and program posters were sent to various fisheries colleges, KVKs and participants of MANAGE-FISHub Program

Personalized emails were sent to the MANAGE-FISHub participants

Regularly reminder Email were sent to registered participants 12 hours and one hour before each live session

Day - 10

31-07-2026

Technology for Seed Production of Vermiculated Spinefoot (Siganus vermiculatus)

Dr. Anuraj A.
Senior Scientist
ICAR–CMFRI
Kochi, Kerala
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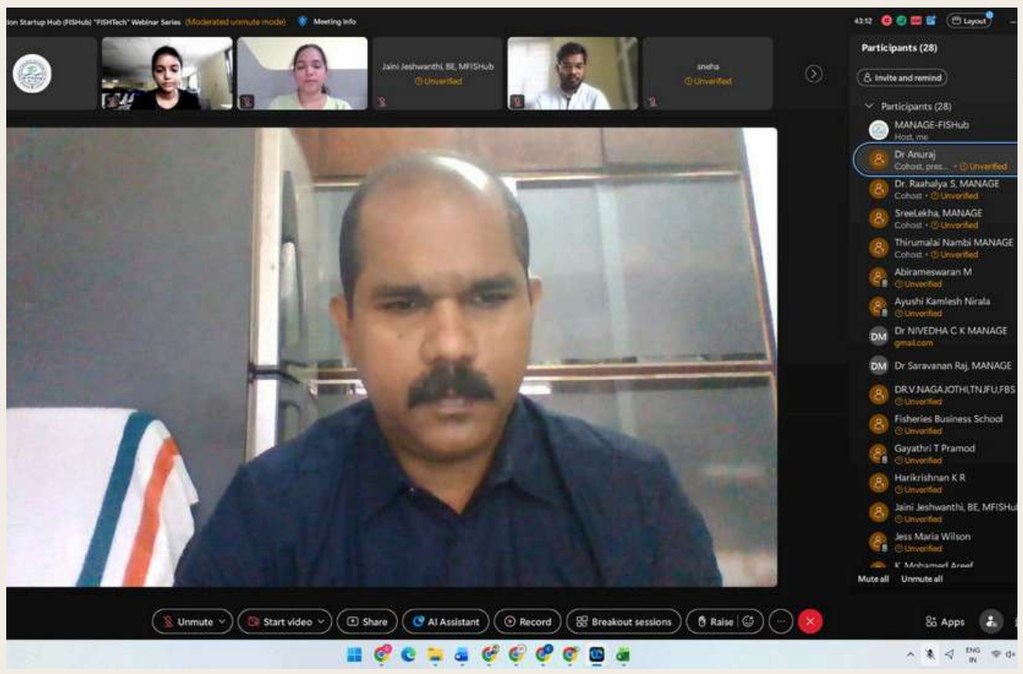
Dr. Anuraj focused on the importance of marine aquaculture, the culture potential of rabbitfishes, and the hatchery protocols developed for the production of quality seed of vermiculated spinefoot.

The speaker highlighted that aquaculture is increasingly contributing to global fish production, while the relative contribution of capture fisheries is declining. He emphasized that the availability of quality seed is a fundamental requirement for the expansion and sustainability of marine aquaculture.

The presentation then focused on rabbitfish (family Siganidae), which are primarily herbivorous and are widely distributed across the Indo-Pacific region. Among the different species, *Siganus vermiculatus*, commonly known as the vermiculated spinefoot or maze rabbitfish, was highlighted as a promising candidate for Indian mariculture. The species possesses several desirable characteristics, including fast growth, tolerance to a wide range of salinity, temperature and pH, low dietary protein requirements, and good consumer acceptance. It can be cultured in ponds, tanks and cages, either as a monoculture or in polyculture systems.

A major portion of the session dealt with the hatchery-based seed production protocol of *S. vermiculatus*. The speaker explained the different components required in a marine hatchery, including water intake and treatment systems, broodstock facilities, spawning and incubation units, larval rearing facilities, live-feed production units, nursery facilities and supporting infrastructure.

Particular emphasis was placed on maintaining a continuous supply of good-quality seawater and freshwater, effective filtration and disinfection, and proper effluent management. The broodstock development and induced breeding procedures were discussed in detail. Wild broodfish can be collected using suitable fishing methods and subsequently reared in cages or recirculating aquaculture systems.

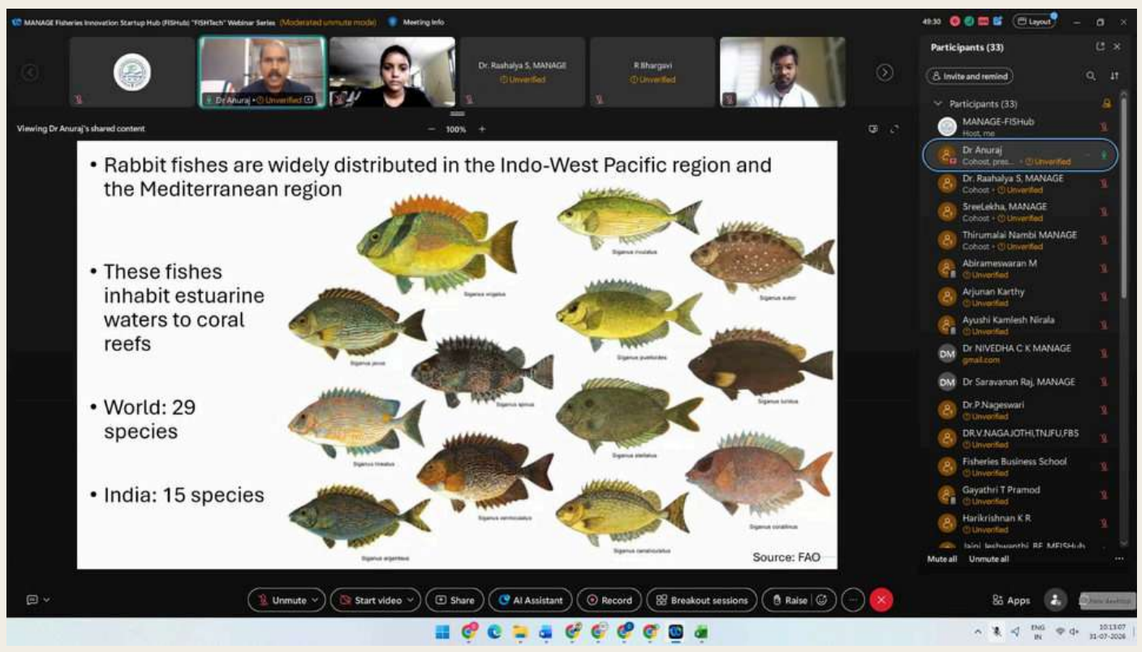


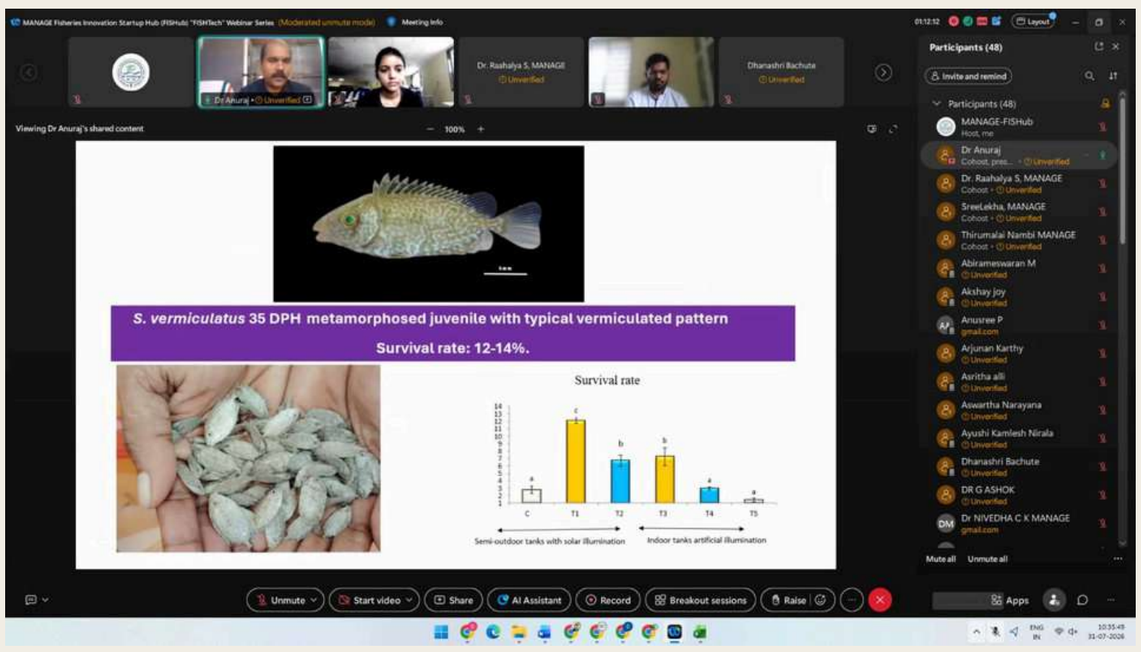
Appropriate maturation diets, supplemented with squid meat and nutritional enrichments, are provided to develop broodstock. Mature females can be identified through cannulation and microscopic examination of oocytes, while males can be selected based on milt quality.For induced spawning, hormones such as human chorionic gonadotropin (HCG) and luteinizing hormone-releasing hormone analogue (LHRHa) are administered at appropriate doses.

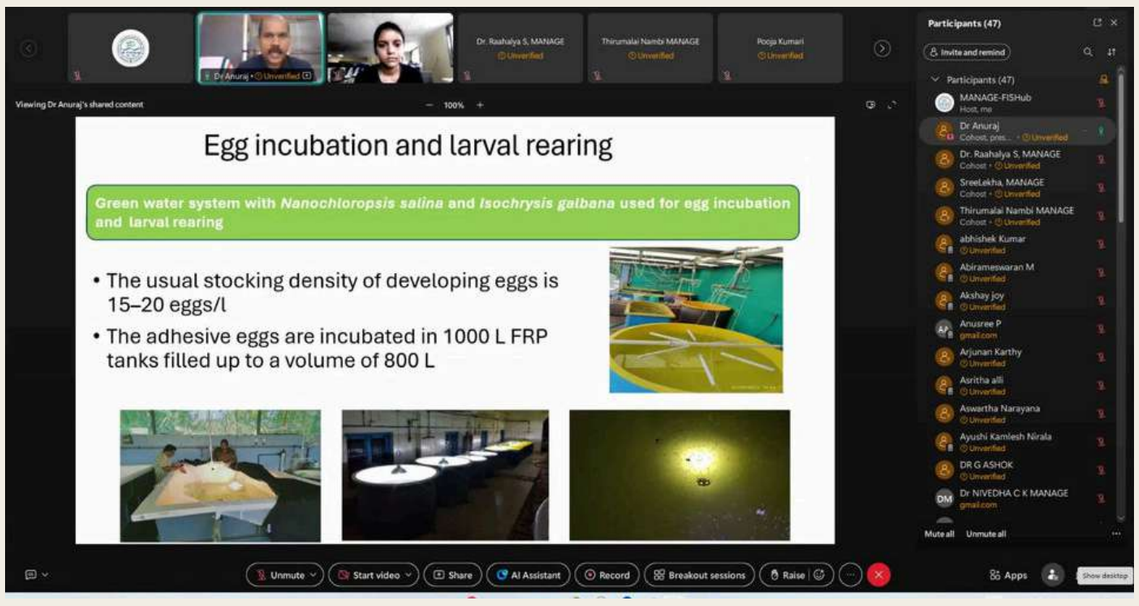
The speaker explained that *S. vermiculatus* exhibits a lunar spawning pattern and can be induced to spawn throughout the year under hatchery conditions.

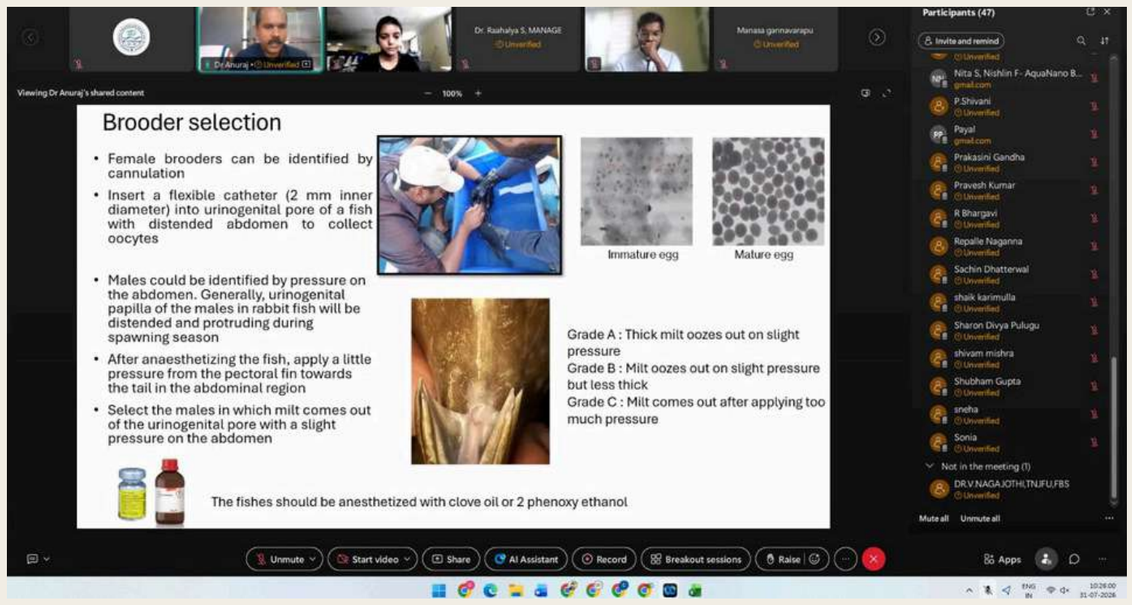
The session further covered egg incubation, larval rearing, live-feed management and nursery rearing. Since the species produces demersal adhesive eggs, tiles are used as suitable substrates for egg collection and incubation. Fertilized eggs exhibit high fertilization and hatching rates under suitable hatchery conditions. During the early larval stages, particular attention is required to live-feed size because of the small mouth gap of the larvae. Proper water exchange, bottom siphoning and feeding management are essential for reducing larval mortality. The developed protocol resulted in survival of approximately 12–14 per cent during larval rearing, while nursery rearing in tanks and cages achieved considerably higher survival rates.

The speaker concluded that the species, owing to its favourable biological traits, low feed requirements, culture adaptability, and market potential, offers promising opportunities for fish farmers, hatchery operators and aquapreneurs. The technology developed for broodstock management, induced breeding, larval rearing and nursery production provides a foundation for the wider adoption and commercial production of vermiculated spinefoot in India.









Q & A Session

Q1. What is the breeding season of *Siganus vermiculatus*?

Ans. The speaker explained that year-round breeding is possible under proper hatchery management, although spawning is closely associated with the lunar cycle, particularly around the full moon and first-quarter phase.

Q2. Can *Siganus vermiculatus* be reared in inland saline water?

Ans. The speaker explained that the species has potential for culture in inland saline waters, with better growth observed under relatively lower-salinity conditions, although further trials may be required.

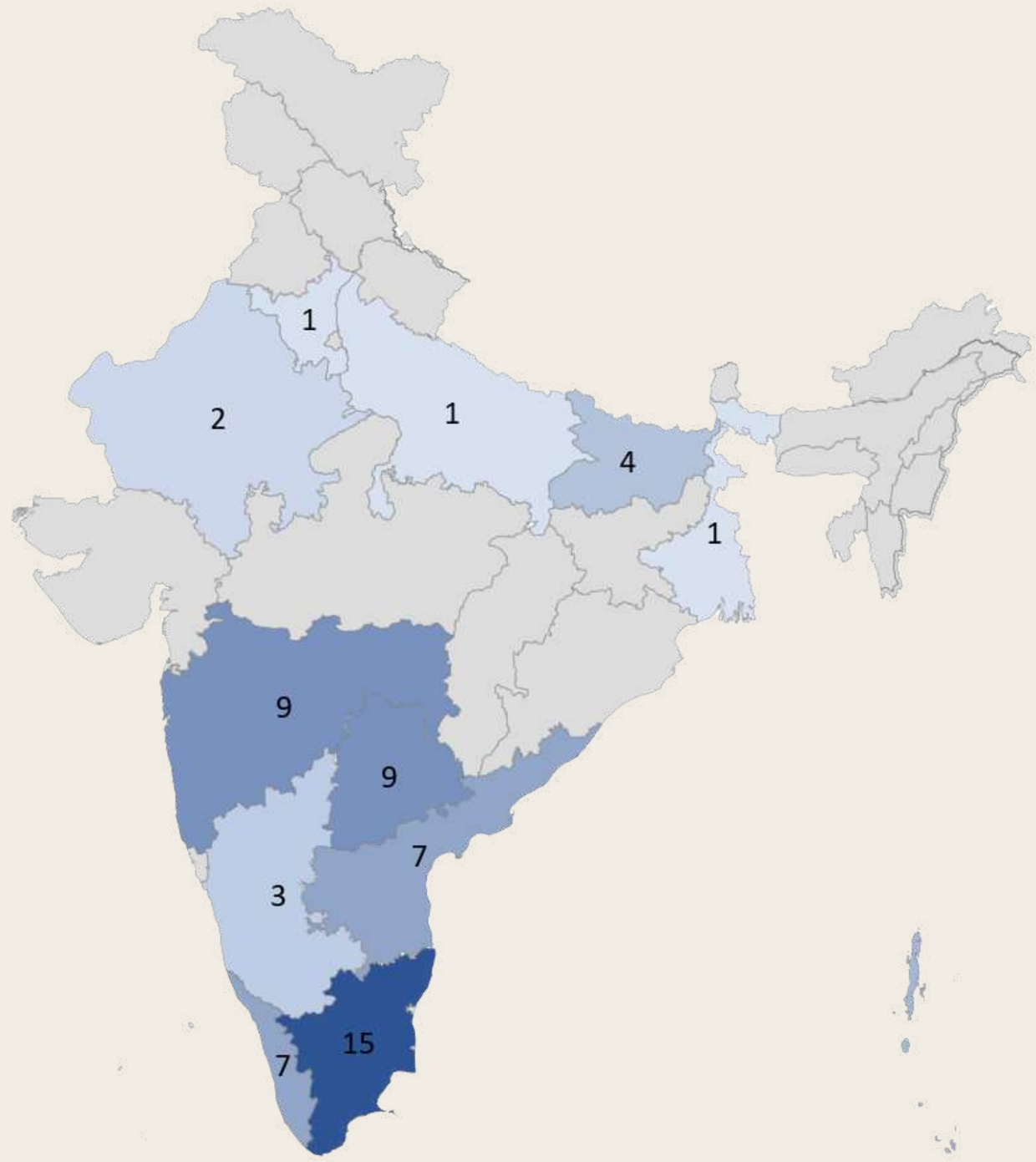
Q3. Have any trials been conducted in Maharashtra?

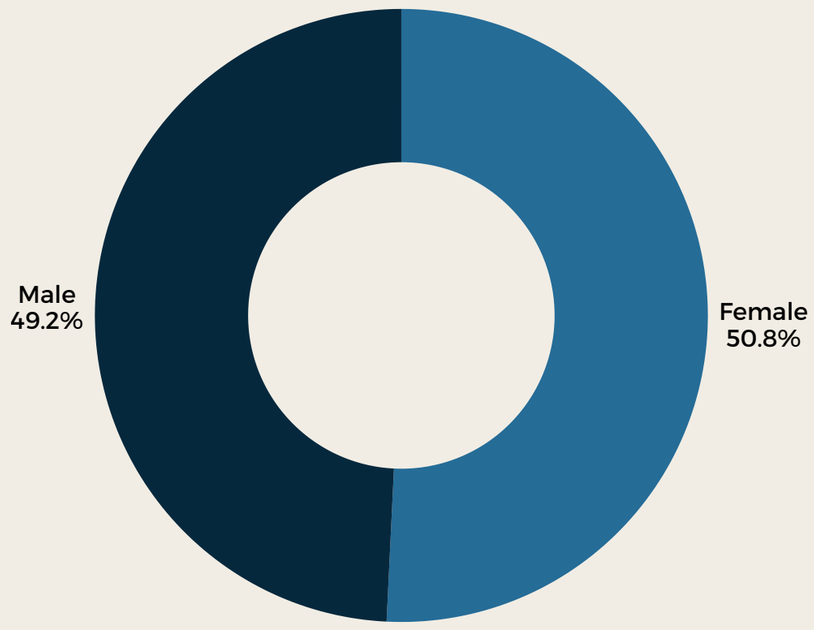
Ans. The speaker explained that trials had been conducted in Sindhudurg in collaboration with the Mangrove Foundation, with the initial broodstock sourced from the Ratnagiri coastal region under the All India Network Project on Mariculture.

Q4. What is the economic importance of *Siganus vermiculatus*?

Ans. The speaker explained that the fish fetches approximately ₹350–500 per kg at the farm-gate level in India and has considerable market demand in the Gulf and Southeast Asian countries, where it can command higher prices.

Participants Overview





Total Registrations-496
Attended Participants -65
(Male - 32; Female-33)

YouTube Video Link: https://www.youtube.com/watch?v=tC35VFvgSAY&list=PL4G41x3BKm6lUBmHoLiRlGoB_5Efxiaep&index=6&t=2s