

# Aquaculture Spectrum™

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## CAGE CULTURE

POPULARISING CAGE CULTURE OF MARINE FINFISHES AMONG TRIBAL POPULATION IN COASTAL ANDHRA PRADESH

- Page 12



**Role of quality control in aqua feeds**

Page 21



**India needs adoption of modern farming systems and species diversification for further Aquaculture development” says Dr. Sessaiah V Pamulapati**

Page 29



**Digital PCR**

The way forward in aquaculture disease detection

Page 35



**Ornamental fish – Auchenoglanis**

Page 50

# POPULARISING CAGE CULTURE OF MARINE FINFISH AMONG TRIBAL POPULATION IN COASTAL ANDHRA PRADESH

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*Backwater cages launched at Krishna Backwaters,  
Nagayalanka Mandal,  
Krishna District, Andhra Pradesh*



## Introduction

Cage farming is widely recognized as one of the most important culture technologies in mariculture for sustainable enhancement of fish production. In India, high saline estuaries are unified ecosystems, that can be considered for cage culture activities as well as for improving the livelihood of selected rural population that depend on these waters for their livelihood. Huge estuarine resources are available along both the east and west coasts of the country and this under-utilized resources could be efficiently used by culturing different species of finfish in cages installed thereof. Several local species of marine finfish can be cultured in high saline estuarine cages. The technology for cage culture of species such as Asian seabass, Indian pompano, silver

pompano, orange spotted grouper and mangrove red snapper has already been demonstrated by ICAR-CMFRI at different locations along the coast.

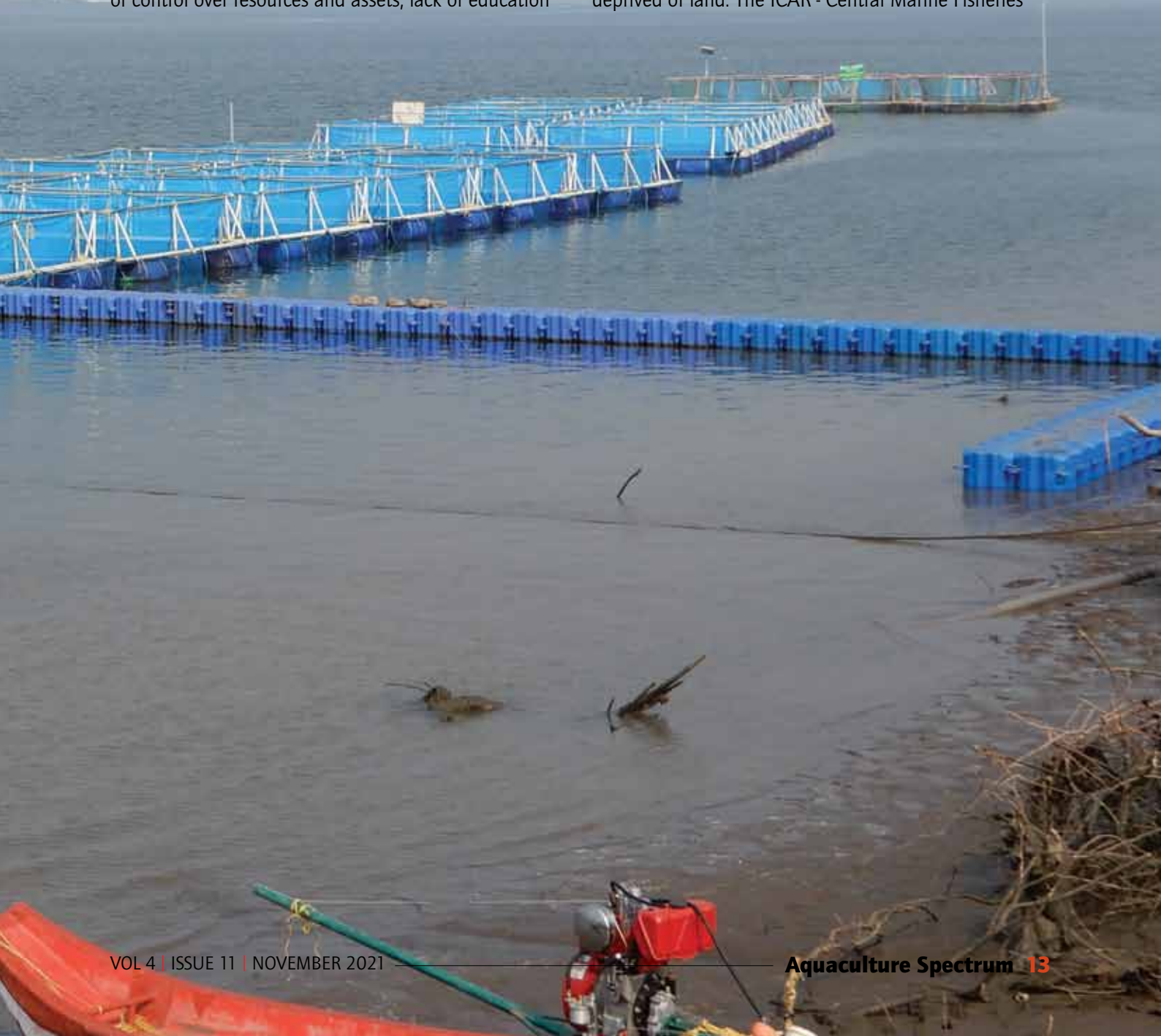
The deltas of three main rivers of Andhra Pradesh—Godavari, Krishna and Pennar; on the eastern coast of India together form a drainage area of around 150,000 km<sup>2</sup>. These vast saline water deltas have an estimated potential area of around 1,74,000 ha, out of which only 21.4% area presently supports aquaculture operations. Therefore, these under-utilized saline water bodies provide ample opportunities for stakeholders such as fishermen, marginal aquafarmers and landless tribal population for practising cage culture activities with different species of finfish for their livelihood and economic development.



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India has a diversified population with different culture and traditions. The tribal population in India are commonly known as "Adivasis", which literally means 'Indigenous People' or 'Original inhabitants of a given region'. Major population of the tribes are found in Chhattisgarh, Odisha, Jharkhand, Madhya Pradesh, the north-eastern states, and the islands of Andaman and Nicobar. In most of the states/places, the tribes always encounter difficulties in their socio-economic development due to various factors like geographical and cultural isolation, lack of proper health facilities, inability to satisfy basic needs, lack of control over resources and assets, lack of education

and skills, malnutrition, and lack of shelter. The social development of the tribal population through economic development paves way for overall development of the community. Several government welfare schemes have been implemented over the years to improve the social status of such tribal groups through economic development. Imparting the population with technical knowledge on different viable technologies will help for sustained development of the community in long term basis. Cage culture technology, that is considered a boon for land-less farmers, is the best choice for economic development of the community deprived of land. The ICAR - Central Marine Fisheries



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Research Institute, has been demonstrating different technologies including cage culture technology for farming marine finfish/shell fish in different coastal states, particularly among tribal populations under the Tribal Sub Plan (TSP) component of the Government of India. The introduced technologies, as alternative livelihood option have resulted in confidence uplift among the different tribal groups resulting in their economic development.

### **Tribal population in Andhra Pradesh and a fisheries perspective**

The total population of Andhra Pradesh, as per the 2011 Census, is 4.95 Crores. Out of which, 27.39 Lakhs (5.53%) are Scheduled Tribes (STs) with male and female distribution of 2.75% and 2.78%, respectively in the total population. Among the total ST population for the state, around 82.72% is located in the coastal districts. There are 33 sub-castes reported under STs in the state, in which five groups namely: Goudu, Malis, Nayaks, Thoti, and Valmiki have been notified with area specificity along north-west Andhra Pradesh. Among the total 33 communities, 12 were identified as Primitive Tribal Groups (PTGs). The average annual growth rate for the tribal population in the state is 14.6%, in which 5 communities exhibited higher growth rates; including Sugalis (36%), Koya (24.4%), Gond (18.9%), Yenadis (16.8%) and Yerukular (12.8%). These five communities' together accounts for 76% of the tribal population in the state. Studies conducted by different researchers have showed that a few tribal communities of Andhra Pradesh are economically and technologically better equipped than the tribes of other regions. Most of them have youth organizations. Some of the developed tribal communities are Savara, Gadaba, Khonds, Koyas, and majority of the people from these communities are involved in diversified occupations like agriculture, fish hunting, preparation of various vegetable dyes, loom, blacksmiths, carpentering, brass work and basket-making. However, a few tribal communities are solely farmers and agriculture labourers, with no skills on modern agriculture practices. Importantly, most of them are now aware of the existing government schemes and their livelihood has considerably been improved over the years by the various government policies and schemes. In spite of all the social obstacles, most of the youth from different sub-caste of the tribes are active and hard workers. Presently, majority of the youth from

few specific tribal communities are actively engaged in fishing both in freshwater and backwater areas. Also, majority of the uneducated youths are working as feed boys and daily labourers in shrimp farms.

### **Yenadis tribal population and relation in fishing**

Yenadis are numerically the third largest Scheduled Tribe sub-caste in the state of Andhra Pradesh. They are mostly distributed in the coastal districts of Nellore, Prakasam, Guntur, Krishna, and also in the plains and forest areas of Chittoor and Cuddapah districts. Unlike other tribal groups, Yenadis mostly live in the plains along with the general population. It is presumed that Yenadis are the original inhabitants of the wilds in the neighbourhood of Pulicat Lake, where they lived by hunting and fishing. A study on the socio-economic and health conditions of the Yanadi tribes indicated that the tribes inhabited the jungles of north coastal districts of Andhra Pradesh. Over a period of time, sizeable number of Yenadis had to change their occupation due to the fast depletion of forest cover. Presently, most of the Yenadis live outside the forest areas, and have lost all of their jungle characteristics. They live as domestic servants and even, as scavengers in the villages of the plains. The Yenadis inhabiting the forest were keen on fishing and they used to catch crabs in mangrove areas, fish in backwaters, catch snakes and field rats. They also used to collect honey and other jungle produce and possessed good knowledge on medicinal herbs.

Due to the active involvement of different government and non-governmental organisations, most of the Yenadis living in coastal district have taken up different activities related to fisheries and agriculture such as, paddy farming, fishing, crab collection, fish culture and as labour in shrimp farming. The small group of population living on the banks of Krishna and Godavari backwaters are issued with fishermen identity cards from the Government of India and are actively involved in fishing. Visakhapatnam Regional Centre of ICAR-CMFRI had identified some of the groups belonging to Yenadi Tribal community associated with a Vijayawada based NGO called "ALERT", for supporting and imparting technical knowledge on cage culture under the Tribal Sub Plan component of the Government of India.



## Initiative of CMFRI towards livelihood improvement of Tribals in Andhra Pradesh

The Central Government of India had introduced The Tribal Sub-Plan (TSP) Scheme with an aim to bridge the gap between the Schedule Tribes (STs) and the general population with respect to socio-economic development indicators in a holistic time-bound manner. The programme has the following objectives:

1. To reduce poverty and unemployment of the Tribals;
2. To eradicate exploitation and help develop the remote areas;
3. To improve the life status of tribal population by providing adequate health and educational services and
4. To provide physical and financial security against any kind of oppression and exploitation.

The plan was implemented through different agencies including research institutions through their technological interventions by imparting technical knowledge to the population.

Cage culture technology is one of the widely accepted technologies for landless people to venture into fish culture activities. The Visakhapatnam regional centre of CMFRI had identified a group of 30 Yenadi tribal community people from Maripalem village, Nagayalanka Mandal, Krishna District during 2018 - 19. This group was selected from Antyodaya Mutually Aided Cooperative Society, managed by "ALERT", Vijayawada. The group, comprising of both males and females were imparted training on cage culture activities. Following the training, the group was supplied with three square cages (5m x 5m x 3m depth) made of galvanised iron. These cages were then stocked with juveniles of Indian pompano (*Trachinotus mookalee*), produced in the marine finfish hatchery of CMFRI Visakhapatnam Regional Centre. As this was a

Participation of Yenadis tribal group in cage culture activities under Tribal Sub Plan



technology demonstration programme, all the inputs related to cage culture such as: cage accessories, seed and feed were provided by CMFRI to the selected group. The cage was managed by the members of the group with technical guidance from CMFRI. After 10 months of culture, the cages were harvested and sold to Maxwell exports, Kochi, Kerala. An income of Rs. 4.5 lakhs was generated through fish sale, and it was shared by the members of the group. In the subsequent years, under the same plan, 13 cages have been installed in different places of Krishna districts including Peddapalem village (Nagayalanka Mandal), Eduromundi village (Nagayalanka Mandal), and Laximpuram village (Krithuvenu Mandal).

### **Impact of CMFRI cage culture demonstrations on Yenadi community**

Presently, different species of marine finfish are being farmed in backwater cages, based on seed availability and market demand. Farming of two species viz., Indian pompano and Asian Seabass have been demonstrated among Yenadi population of Krishna district. CMFRI demonstrations reveal that an average of 500 to

600 kg of fish can be harvested from a single cage during a culture period of around 10 months, which provides the farmer a profit of upto Rs. 75,000/crop/year. The Visakhapatnam RC of CMFRI, over the last three years have made continued efforts to familiarise the concept of cage culture among Yenadi tribal community through their awareness and training programmes.

The continued efforts of CMFRI have created confidence and self belief among the tribal population, and several of them have come forward with keen interest and enthusiasm for involving in cage culture activity. Krishna district of Andhra Pradesh is bestowed with vast area of backwaters and act as potentials source for marine finfish seeds. The group of Yenadis living on the banks of Krishna backwaters are well experienced in collection of crabs and fishes for their daily livelihood. The concept of capture-based aquaculture using wild collected seeds has also been inculcated among the tribal population. The result of which, many are actively involved in cage related activities, and a few have installed indigenous low-cost cages made of wood using their own investment.

*Training for beneficiaries from Yenadis community under Tribal Sub Plan*







*Harvest of cage cultured Indian pompano by Yenadis under Tribal Sub Plan*

## Conclusion

While social status and equal opportunities for all citizens are ensured by the constitution of India, economic development is the basis for improving the livelihood status for any individual. Advent of modern innovative technologies in agriculture and allied sectors and effective use of these technologies have helped the poor and traditional population of India in enhancing their livelihood. Cage culture technology for producing marine finfish in estuarine waters has been gaining popularity throughout the country among fishermen communities and marginal fish farmers. This technology is now very well established in the coastal districts of Andhra Pradesh. The Yenadis, with more than 90% of them being landless, eke out their sustenance by hunting crabs in the mangroves, by catching rats from

agricultural fields or by habitual seasonal migrations, are expected to maximally utilise this technology. Initial efforts, involving few tribal groups under the tribal plan with assistance of ALERT NGO that had been given wide spread publicity, has instilled confidence among the landless tribes to take up cage culture activities. After the initial success in 2018 - 19, our efforts have continued to popularise and disseminate the technology among the different communities of scheduled tribes in different coastal districts of the state. The cage culture established for marine finfish by Yenadis tribal communities in Krishna backwaters is viewed as model by the landless tribes, and is emulated for livelihood improvement by those who do not have any reliable source of income in the coastal districts of Andhra Pradesh.