

# Fisheries Infrastructure in Coastal Andhra Pradesh - An Appraisal of Government Support

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**Abstract:** *Andhra Pradesh is one of the best maritime states of India, enriched with second longest coastline with 974 Kms, 33, 227 Sq. Kms of continental shelf area, 8 lakh hectares of inland water bodies, 2.12 lakh hectares of aquaculture area, river and canals stretching over 18.24 lakh hectares and mangrove area of 352 Sq Kms. The State has all required supporting infrastructure like State - of - the - art facilities for shipment at 3 ports at Visakhapatnam, Krishnapatnam & Kakinada, 92 processing plants with about 5, 000 MT processing capacity per day, 107 cold storages with 2.00 lakh MT storage capacity, 389 shrimp hatcheries with more than 60, 000 million seed production capacity, 36 feed plants with 10, 000 MT production capacity per day and 225 aquaculture labs with all aqua input testing facilities. The fisheries sector's contribution to State GVA is 8.24 % and 27.91 % to agricultural GVA and providing livelihood opportunities to 20.15 lakh populations either directly or indirectly in the State. The present paper attempts to study about the infrastructural facilities that are available for development of fishing and fishermen in the state along with future prospects of fish industry in the state.*

**Keywords:** Andhra Pradesh fisheries, fishing infrastructure, aquaculture development, fish industry growth, fishermen livelihood

## 1. Introduction

India is the world's second - largest aquaculture nation and the third - largest fish producer after China. The Indian Blue Revolution has led to a major improvement the fishing and aquaculture industries. The industries are regarded as sunrise sectors and are anticipated to have a big impact on the Indian economy.

Indian fisheries have recently seen a paradigm shift from inland to marine - dominated fisheries, with the latter becoming a major contributor to fish output, from 36% in the middle of the 1980s to 70% in the recent past. The transition from capture - to culture - based fishing in inland fisheries has opened the way for a stable blue economy. At the primary level, the sector supports the livelihoods of roughly 16 million fishers, fish farmers, and thousands of people along the value chain. While inland fisheries and aquaculture have increased in absolute terms, their potential has not been fully realized. The 191, 024 km of rivers and canals, 1.2 million ha of floodplain lakes, 2.36 million ha of ponds and tanks, 3.54 million ha of reservoirs, and 1.24 million ha of brackish water resources—vast, underutilized resources—offer excellent opportunities for increased production, creation of livelihoods, and emergence of economic prosperity.

### Current state of the Fisheries & Aquaculture Sector of India

More than 10% of the world's fish and shellfish species are found in India's rich and diverse fisheries, including deep seas, lakes, ponds and rivers. The country's extensive coastline, exclusive economic zone (EEZ) and sizable continental shelf region are home to marine fisheries resources. The resources for inland fisheries include rivers, canals, floodplain lakes, ponds, tanks, brackish water and regions that influence salty or alkaline conditions. Aquaculture in brackish or saline water has flourished in India. Farmed shrimp production increased from 20 MT in 1970 to 7.47 lakh MT in 2020, adding significantly to the

export revenues of fisheries, which has seen tremendous expansion over few decades.

Presently, India produces 7.96% of the world's fish. The estimated total fish output for FY 2020–21 is 14.73 million metric tonnes (MMT), with contributions from the inland and marine sectors at 11.25 MMT and 3.48 MMT, respectively. With India being one of the top seafood exporters worldwide, the fishing industry is crucial to its economy and has historically been a significant source of foreign exchange earnings. Despite the market uncertainties brought by the covid - 19 pandemic, exports of marine products were valued at Rs.43, 717.26 crore (US\$ 5.37 billion) during FY 2020–21. The US is the largest importers of Indian seafood accounting for 41.15% imports worth US\$ 24.05 billion in FY 2020–21. Inland fisheries have experienced a transition from capture to aquaculture over the past 25 years. With a 34% share in inland fisheries in the middle of 1980, freshwater aquaculture has expanded to roughly 76% in recent years.

### Current state of the Fisheries & Aquaculture Sector of Andhra Pradesh

Andhra Pradesh stands first in total fish and prawn/shrimp production in India since 2013 - 14 both in terms of production and value. The contribution of the fisheries sector is 6.01 % in A. P's. GSDP, whereas the fisheries contribution is about 0.83% of the GDP of the nation. The overall fish production has more than doubled in the past decade from 8.14 lakh tons in 2005 - 06 to 19.64 lakh tons in 2014 - 15. The share of Andhra Pradesh in India's seafood exports has increased from about 20% in 2009 - 10 to about 40% in 2013 - 14. During 11 2009 - 10, the exports from Andhra Pradesh were Rs.2, 100 crores but by 2013 - 14 exports have increased to Rs.12, 100 crores. During 2014 - 15, the marine exports have been increased to an estimated value of Rs.16, 000 crores. Nine out of thirteen districts of Andhra Pradesh are along the coastline and the total length of the coast is around 974 KM. The total continental shelf is more than 33, 227 Sq. km. The total marine fishermen

population in the state is around 6.05 lakh and sea - going fishermen are around 1.5 lakh. The total fishing crafts in the state are around 29, 195 with around 12, 747 motorized crafts, 1771 Mechanized, and 14677 traditional crafts. There are 4 fishing harbors 353 fish landing centers and 555 fishing villages.

Andhra Pradesh State is focusing on establishment of necessary infrastructure in both, capture fisheries and aquaculture sector which mainly includes:

- 1) Establishment of 2 new fishing harbours, one at Juvvaladinne of Nellore District, another at Uppada of East Godavari District and up gradation of existing 2 fishing harbors at Machilipatnam and Nizampatnam under Phase - I with total project cost of Rs.1510 Crore. In Phase - II another five new Fishing harbors are planned for establishment at Budagatlapalem (Srikakulam), Pudimadaka (Visakhapatnam), Biyyaputippa (West Godavari), Vodarevu (Prakasam) Kothapatnam (Prakasam) with a project cost of Rs.2000 crore with all facilities on par with international standards with funding support from FIDF, PMMSY, NABARD and State funds.
- 2) Establishment of Aquatic Quarantine Facility (AQF) Centre for L. vannamei in Visakhapatnam District to facilitate shrimp hatchery operators to quarantine their imported brood stock and hatcheries for sea bass and mud crab in Guntur District with a total project cost of Rs.75 Crore for production and supply of quality seed for promotion of alternate species culture with funding support from RKVY, State funds.
- 3) AP has well established aquaculture labs for testing, besides existing 225 labs, the Government is establishing integrated aquaculture labs at 35 locations in 9 coastal districts with all aquaculture input testing facilities with an estimated project cost of Rs.50 Crore with funding support from RKVY, NABARD and State funds.
- 4) Establishing 70 Aqua hubs and about 14, 000 units of retail outlets for the promotion of domestic marketing under the brand of "Fish Andhra - Fit Andhra" with a total project cost of Rs.558 Crore across the state with funding support from PMMSY and State funds.

### **Cold Chain Infrastructure Development of Fisheries Andhra Pradesh**

Pradhan Mantri Matsya Sampada Yojana, one of the flagship projects of Indian Government is bringing about a blue revolution, in the cold chain infrastructure of Andhra Pradesh State. In association with the Commissionerate of Fisheries, Andhra Pradesh, the Pradhan Mantri Matsya Sampada Yojana has become the harbinger of a tide of change in the state.

India, the second largest aqua - culture producing nation in the world, contributes 7.73% of the global fish production. In the year, 2013 - 2014, export earnings were of Rs.36, 589 Crores, with annual average sector growth rate of 10.88%. Clearly, India has the potentiality to be the highest fish producing nation in the world.

With 974 Kms of mainland coastline, Andhra Pradesh is the second longest coastline state in India. It is the leading

maritime state in south India, which is strategically located at India's eastern seaboard.

In comparison with the 24 hours shelf that a fish caught in India gets, fish caught in a developed country gets infinite shelf life. To solve this is the main objective of Pradhan Mantri Matsya Sampada Yojana. Minus 18 Degree Celsius Cold Chain Infrastructure need to be created this would bring about infinite shelf life for sea - food in India. This will reduce food wastage and give better prices for fishermen and aqua culturists. This would also improve the Fisheries Management Plan, while ensuring quality. Modernizing the value chain would improve export competitiveness and increase productivity. This can also be utilized as antibiotics and residue storage.

The plan to mobilize 10 Ft Reefers to all 25 Hubs planned for this year is excellent, because it gives 3 in one Utility, that of Chilled room, cold - room and ice - plant. If you set temperature above zero degree Celsius, you got chilled room. If you set temperature below zero Deg C, you got cold room. This can also be used to convert water to ice, giving utility of an ice - plant. Today, everyone wants to reduce capital expenditure. The reefer rental model helps you to achieve exactly that, with zero capital investment. Moreover, this is a portable, scalable, plug and play model. Free service and maintenance comes along with it, which is also less on switch over cost. Each 10ft Reefer Payload capacity is 8 Tons. Compared to the value of 8 tons of sea - food, only a nominal rental charge is applicable per day.

This way Pradhan Mantri Matsya Sampada Yojana, by improving the cold chain infrastructure of Andhra Pradesh fisheries, is bringing about a blue revolution. From Catch to customer this project is creating new tides of change.

### **Fisheries Infrastructural Facilities in Andhra Pradesh**

The fisheries department provides infrastructure facilities for the purposes of feed analysis, water analysis, soil analysis, and microbial analysis. It also provides various facilities, including disease diagnosis with PCR, fish hatchery units, fish processing plants, mobile aqua labs, the Fish Andhra initiative, insulated vehicles, three - wheelers with iceboxes, fishing nets, seaweed culture rafts, deep - sea fishing vessels, fish traps, open sea cages, and established fish kiosks.

Each of the infrastructural interventions was deliberately designed to enhance the organization of fisheries.

- 1) **Feed Analysis:** As feeding characteristics of fish play a key role in determining its successful colonization (Toneela et al., 2012), the fish feed was formulated to ensure it is nutritionally balanced and specifically tailored to meet the needs of different fish species. In addition, the feed was tested for protein, fat, fibre, ash, and moisture content.
- 2) **Water Analysis:** Since the aquatic ecosystem primarily depends on water, the analyzing the physical, chemical and biological characteristics of water ensures the well - being of the fish population (Gorlach - Lira et al., 2013) and facilitates the fish farmer's ability to maintain a suitable aquatic environment. In addition, a fishery unit may be supplied with groundwater (from wells and underground aquifers), surface water (from rain and runoff) or both; since these water sources might contain

high level of dissolved gases like carbon - di - oxide and hydrogen sulphide and metals; it become necessary to well test the water quality (Stone et al., 2013). Water has been analyzed for its many parameters, such as pH, temperature, hardness, alkalinity, calcium, magnesium, total dissolved solids (TDS), chemical oxygen demand (COD), biochemical oxygen demand (BOD), iron, ammonia, salinity, nitrate, nitrite, chlorine, hydrogen sulphide, and phosphate.

- 3) **Soil Analysis:** As soil properties have a direct influence over fish productivity (Delince, 2013), analyzing the soil condition provides valuable insights about the soil condition and its impact on fish farming. The soil analysis includes tests for soil pH, organic carbon, nitrogen, phosphorus, and minerals, as soil properties have the ability to influence farming practices and enhance fish productivity through chemical transformation, exchange of nutrients and recycling role of soil.
- 4) **Microbial Analysis:** It enables fish farmers to effectively manage water quality, as certain micro - organisms can affect human health through direct contact or consumption of fish cultivated in contaminated water (Gorlach - Lira et al., 2013); which avoids potential disease outbreaks and supporting sustainable aquaculture practices. In this regard, the microbial test carried out were Total Plate Count, Total Vibrio Count, Aero monas, Luminescent Bacteria, Biochemical Test, Fungal Test, Drug Sensitivity, Streptococci, E. coli, and Shilgealla Bacteria. All these tests were conducted at the district - level Fisheries Departmental Office and also in the aqua labs situated in the main fish cultivation areas. The state had 234 Aqua labs and was about to establish a large Integrated Aqua lab with high - end equipment for testing. With the advancement of technology, the department has implemented many innovative approaches.
- 5) **Polymerase Chain Reaction (PCR):** It is a groundbreaking approach that enables fast and reliable identification of fish bacterial diseases at reduced cost and necessary time for disease control (Sebastiao et al., 2011). Separate training was given to technicians who operate PCR. Though there are many PCR machines, none of them were functional at the time of the researcher's field visit because of lack of qualified persons to operate it (Karki, 2012).
- 6) **Fish Hatchery Units:** Earlier, supply of fish seeds was depended on natural sources. But environmental degradation and other anthropogenic consequences deteriorated the natural sources of fish seeds; which leads to dependency on artificial fish seed production and distribution (Faruk et al., 2012). In order to meet the present demand of fish seed, fish hatchery units were established by the State Fishery of Andhra Pradesh, which enables the department's ability to control breeding and propagate quality fish species. Further, it contributes to the preservation and enhancement of aquatic biodiversity.
- 7) **Fish Processing Plants:** Value addition or processing acts as a strategy to ensure food security (Lucas et al., 2009), increase the income of farmers and minimize the post - harvest loss. In this regard, the state has established 64 processing plants to streamline the post - harvest stage.
- 8) **Mobile Aqua Labs:** Mobile aqua labs were established by Fishery department of Andhra Pradesh; through which scientific expertise and extension services were brought closer to fish farmers in remote regions through mobile trucks. This has catalyzed knowledge transfer and fostered sustainable fishing practices among fish farmers in unreachable regions.
- 9) **Fish Andhra Fit Andhra:** It was one of the very recent initiatives by the State Department of Fisheries that aims to support local fish vendors in establishing live fish meat selling outlets with financial and technical assistance from the state department of fisheries.
- 10) **Fish Kiosks:** Kiosks acts as a best way to provide customers with food traceability information. They were established by fishermen with the guidance and support of the fisheries department. These kiosks serve as fish outlets near coastal areas. The infrastructural interventions of the Fisheries Department of Andhra Pradesh were available at kiosks.
- 11) **Traditional Fish Farming:** Because of the socio - cultural practices of the fish farmers (Das, 2002), some of the fish farmers (laggards) prefer traditional fish farming techniques than modern techniques. In this regard, State Fishery Department of Andhra Pradesh provides certain interventions for traditional fish farmers, to conserve fish stock and promote sustainability in fish farming. The interventions include;
  - Deep - sea fishing vessels
  - fishing nets
  - Fish traps
  - Open sea cages
  - Seaweed rafts given to traditional fishermen.
- 12) **Others:** Absence of regular subsidy programmes (Chowdhury et al., 2014) imposes difficulties in fish cultivation among farmers. While, through state subsidy programmes, the Fisheries department of Andhra Pradesh deploys
  - Motorcycles with iceboxes
  - Insulated vehicles and
  - Three - wheelers with iceboxes.

## 2. Conclusion

The 9 coastal districts in Andhra Pradesh are endowed with huge water resources and makes the districts, more competitive in the production of fish and shrimp. Since this sector is competitive, the future prospects are the fish production is influenced by the past values of fish production, Since the fish sector is important, blocks/Mandals may be clearly earmarked into aqua culture zones for their growth leading to the nutritional security and employment generation within the districts and state.

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