

# SUSTAIN FISH 2019



AWARENESS WORKSHOP ON  
**HARVEST & POST HARVEST INTERVENTIONS FOR  
MAINSTREAMING BIODIVERSITY  
CONSERVATION INTO THE FISHERIES SECTOR OF  
EAST GODAVARI RIVERINE AND ESTUARINE ECOSYSTEM**



ICAR –CENTRAL INSTITUTE OF  
FISHERIES TECHNOLOGY  
(ICAR-CIFT)  
VISAKHAPATNAM RESEARCH CENTRE



EGREE FOUNDATION :: CORANGI  
(EAST GODAVARI RIVERINE AND ESTUARINE ECOSYSTEM)  
AN INITIATIVE OF  
GOI-UNDP-GEF-GOAP PROJECT





# SUSTAIN FISH 2019



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## Marine Fishery Resources of Andhra Pradesh

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Andhra Pradesh with a coastline of 974 km encompassing 9 coastal districts has had a long history of fishing. Starting with traditional fishing in ancient times to the modern, technology-intensive fishing, the marine fisheries sector of the state has grown tremendously reaching record landings of 3.42 lakh tonnes in 2014. The state has 555 marine fishing villages with 353 marine fish landing centres (CMFRI Marine Fisheriers Census, 2010). There are two major fishing harbors at Visakhapatnam and Kakinada where bulk of total trawl catch (nearly 70%) is landed and three minor fishing harbors at Bhairavapalem, Machilipatnam and Nizamapatnam. The marine fishermen population of the state is more than 6 lakhs with roughly a quarter of them, being active in fishery related activities throughout the year. There are 31,741 fishing crafts in the marine fisheries of Andhra Pradesh (CMFRI Marine Fisheriers Census, 2010). The marine fisheries sector, at present, is an important source of employment and income generation in the state, but is plagued with several problems. As because, this sector is vulnerable to external influences viz., overexploitation of marine resources, environmental degradation and climate change, efficient management is the need of the hour.

### MARINE FISH RESOURCES

The average annual marine fish landing of Andhra Pradesh during 2012-2018 was 2.58 lakh tonnes. There has been wide fluctuation in the landings. The annual average catch showed an increasing trend initially, from 3.05 lakh tonnes in 2012 to 3.42 lakh tonnes in 2014, after which, there has been a sharp decrease in the landings. The landing in 2018 was 1.92 lakh tonnes, a decrease by 43.7% from the peak recorded in

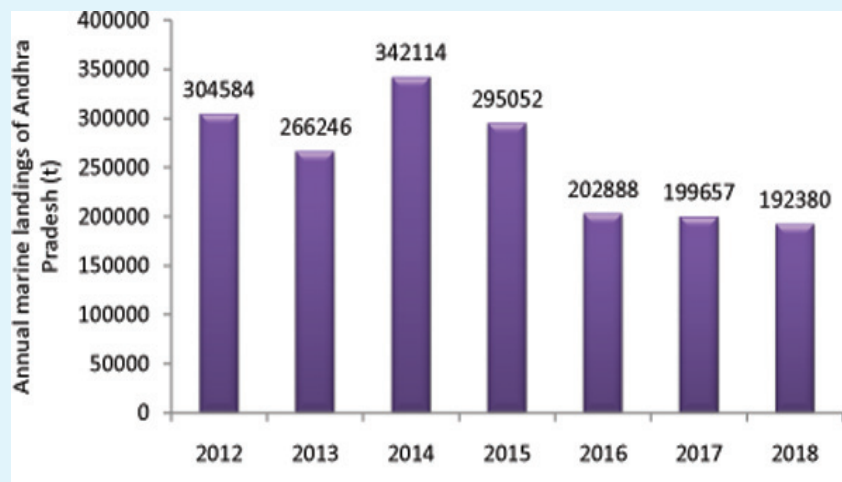


Fig. Trends in Marine landings of Andhra Pradesh

2014 (Fig 1). This decrease is mostly contributed by the decrease in the landings of pelagic resources (Fig 2), due to rampant use of small meshed surrounding gears and environmental fluctuations leading



Fig.2 Resource-wise marine landings of AP during 2012-2018

to spawning and recruitment failures. Pelagic fin fishes contributed 67% to the total marine catch, followed by demersal fin fishes (21%), crustaceans (11%) and molluscs (1%). The major groups that contributed to the fishery were clupeids, prawns, Indian mackerel, ribbon fishes, carangids, croakers, elasmobranchs, threadfin breems, tunas and cephalopods. The top six landed groups in Andhra Pradesh

during 2012-2018 were lesser sardines (excluding Indian oil sardine), Indian mackerel, penaeid prawns, ribbonfish, croakers and oil sardine (Fig 3).

Among pelagics in 2017-2018, the major contributors were clupeids (51%), followed by Indian mackerel (17%), ribbonfish (12%), carangids (11%), tunas and billfishes (4%) and seerfishes (3%). Croakers, with 18%, contributed the most to the demersal landings during 2017-2018, followed by perches (12%), silverbellies (12%), pomfrets (10%), catfishes (9%), goatfishes (9%), threadfin breems (8%), elasmobranchs (6%), lizardfishes (5%) and eels (5%). Around three-fourth of the crustacean landings were by penaeid prawns, the rest by crabs (22%), non-penaeid prawns (5%) and lobsters and stomatopods (1%). Two-third of the cephalopod landings was by cuttlefish and the rest by squids.

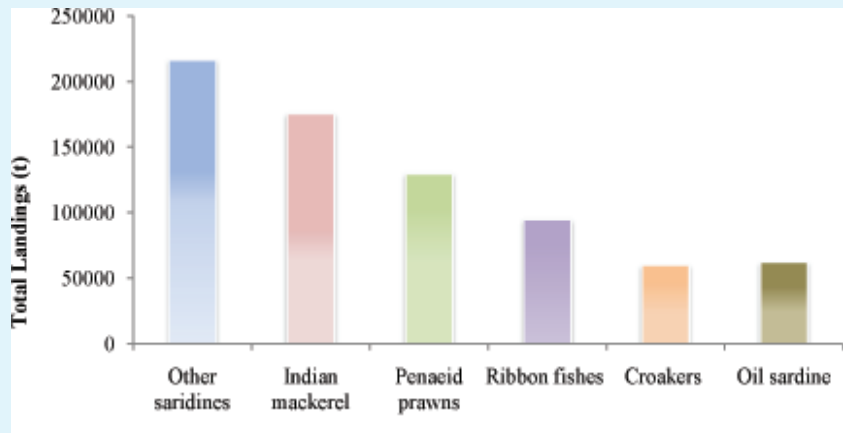


Fig.3 Top six landed groups in Andhra Pradesh during 2012-2018

## FISHING CRAFTS AND GEARS

The marine fishery of Andhra Pradesh is contributed by mechanized (10%), motorized (34%) and traditional (56%) sectors with the motorized and mechanized sectors slowly and steadily replacing the traditional sector (Fig. 4). Among 31,741 crafts in the fishery of Andhra Pradesh in 2010; 3,167 are mechanized; 10,737 are motorized and 17,837 crafts in non-motorized sector. During 2017-2018, the contribution of the mechanised sector to the marine fish landings was 46%, followed by motorised sector (40%) and non-motorised sector (14%).

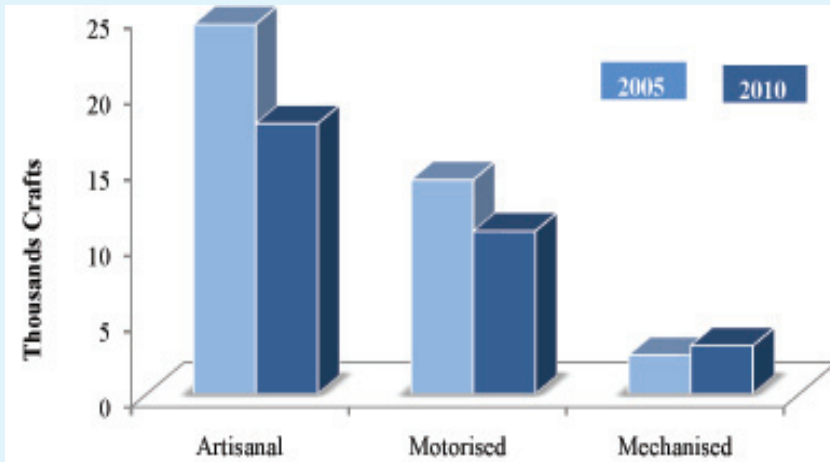


Fig.4 Crafts operating in the marine fisheries sector of Andhra Pradesh

In the mechanized sector gillnetters, trawlers and ring seiners constitute 52%, 42% and 6% of the total mechanized crafts. Visakhapatnam district contributes 43% of the total trawlers of Andhra Pradesh with 579 trawlers, 36% in East Godavari district with 487 trawlers, 11% in Guntur district with 150 trawlers, 10% combined in Krishna and Prakasam districts with 85 and 40 trawlers respectively in 2010 (CMFRI Marine

Fisheries Census, 2010). Trawlers contributed substantially to the catch of penaeid and non penaeid prawns, ribbon fishes, Indian mackerel, croakers, threadfin brems, carangids and cephalopods. During 2012-2018, trawlers contributed 43% to the marine landings of the state. Their catch rate ranged from a maximum of 34.13 kg/hr in 2014 to a minimum of 19.58 kg/hr in 2016. The catch rate showed a decreasing trend during this period. The catch rates in other years were 29.3 kg/hr in 2012, 26.13 kg/hr in 2013, 22.95 kg/hr in 2015, 22.06 kg/hr in 2017 and 23.11 kg/hr in 2018. This indicates that trawl fisheries in the state are moving towards economic and ecological unsustainability. The contribution in landings by ring seines was 19% with an average catch rate of 552 kg/unit during 2010-2018. The highest catch rate in ring seine of 670 kg/unit was observed in 2014 and the lowest catch rate of 414 kg/unit was in 2018. The catch rate in other years were 554 kg/unit in 2010, 539 kg/unit in 2011, 629 kg/unit in 2012, 453 kg/unit in 2013, 636 kg/unit in 2015, 588 kg/unit in 2016 and 483 kg/unit in 2017. The number of ring seine units in the marine fishery of Andhra Pradesh peaked in 2014 (Fig. 5), with dire consequences. Mostly, Indian mackerel and clupeids were landed in ring seines. Gillnets contributed 17% to the annual marine landings of the state, with an average catch rate of 70 kg/unit during 2012-2018. The contribution by hooks and lines to the marine fishery was 7% in 2012-2018 with an average catch rate of 66 kg/unit. Artisanal gears during the same period contributed 14%.

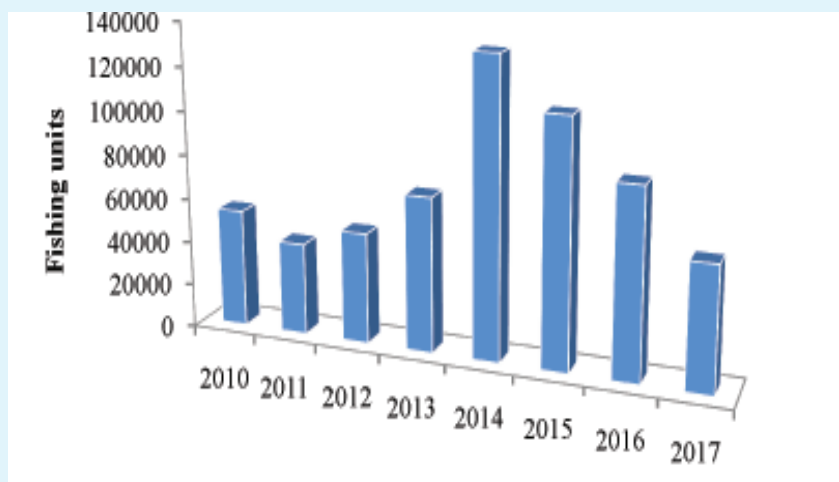


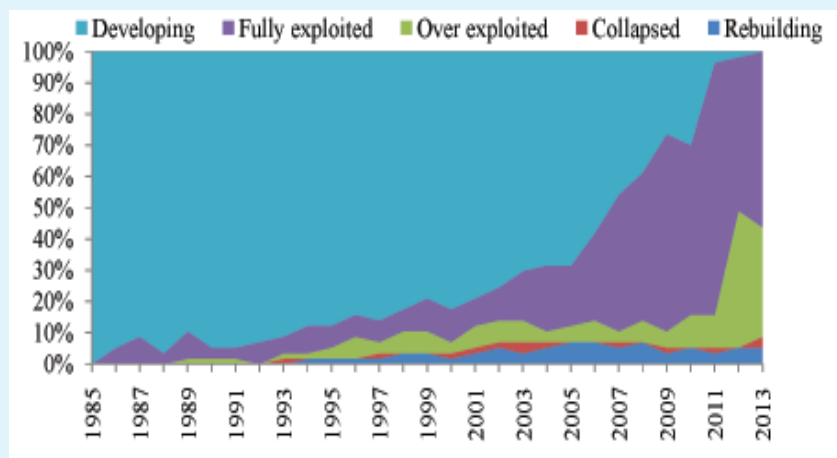
Fig.5 Ring Seine annual fishing effort in the marine waters of Andhra Pradesh

**Table 1. Peak spawning months of few commercially important marine resources of the state**

Species	Spawning months
Sardinella longiceps	May-July
Rastrelliger kanagurta	July-September and March
Trichiurus lepturus	September-February
Katsuwonus pelamis	December-March
Thunnus albacares	November-February
Nemipterus japonicus	November-December
Otolithes ruber	October-February
Metapenaeus monoceros	May-June
Loligo duvaucelli	Around the year

## STOCK STATUS

Stock status reveals that with years passing by, the number of stocks in "developing" category decreased and by 2013, no stocks were found in "developing" category. Consequently, the number of stocks in "fully exploited", "overexploited", "collapsed" and "rebuilding" categories gradually increased over the years. In 2013, 56.1% of the stocks were "fully exploited", 36.8% of the stocks were "overexploited", 3.5% of the stocks were "collapsed" and 3.5% of the stocks were "rebuilding" (Fig. 6).



*Fig. 6 Stock status of Andhra Pradesh*

Most of the pelagic and demersal finfish stocks were "fully exploited" and bulk of the rest "overexploited"; whereas shellfish stocks were equally "fully exploited" and "overexploited".

### Recommendations for sustainable management and conservation of marine fish resources

(Muktha *et al.*, 2018; Policy Guidance on Sustaining the Marine Fisheries of Andhra Pradesh)

- 1) **Review, updating and stricter implementation of Marine Fishing Regulation**
  - a. Establishment of Enforcement Units
- 2) **Input controls**
  - a. Regulation of fishing effort

- i. Optimal Fleet size - According to CMFRI estimates, a total of 1300 mechanized fishing boats are optimal for fishing the marine resources of Andhra Pradesh. Presently, there are 2100 mechanized crafts in Andhra Pradesh. Currently, the state has 62% excess fishing capacity. It is proposed for the govt. to initiate buy-back measures or diversification of fishing crafts to new fishing/non-fishing sectors in bringing about fleet size reduction. Use of Bycatch Reduction Device and Turtle Excluder Device to be made mandatory in mechanised trawlers.
  - ii. Replacement of all mechanized fishing vessels older than 20 years
  - iii. Total prohibition on construction of new mechanized boats
  - iv. Re-registration of new fishing crafts
  - v. Classification of crafts based on use of engine for propulsion and fishing
  - vi. Engine power - craft size limits - The maximum allowable engine horsepower to be 140 for vessels upto 15.0 m OAL, 200 for vessels between 15.0 to 17.5 m OAL, 250 for vessels between 17.5 to 20.0 m OAL and > 250 for vessels >20.0 m OAL.
  - vii. Restriction of high powered crafts (300 Hp and more) from trawl fishing
  - vii. Zonation of trawl fishing through craft classes
- b. Diversification of fishing effort
- i. Conversion of trawlers - Conversion of shrimp trawlers to tuna liners is already being advocated. Additionally, conversion of destructive bottom trawls to less-damaging mid-water fish trawls should be encouraged. Also, trawlers using high powered engines should be diverted to deep sea longlining and/or gillnetting.
  - ii. Mesh size regulations - 40 mm square meshed cod end in trawls to be implemented strictly for reducing capture of juvenile fish.
  - iii. Registration of fishing gears
  - iv. Restriction on number of ring seines
  - v. Seasonal closure of fishing - Closed fishing season of 61 days is already in vogue, however, a second fishing ban during the winter months is the need of the hour as majority of the commercially important finfishes and shellfishes breed during the winter months.
  - vi. Area closures for fishing/Marine Protected Areas
  - vii. Increasing use of economic efficient gears and fishing techniques - Tuna long liners targeting tuna and other large pelagics to be promoted for higher economic returns to the fisherfolk and for making fishing operations more lucrative and profitable.



### 3) Output Controls

- a. Minimum Legal Size - Minimum Legal Size for capture of 36 commercially important marine finfish and shellfish species has been advocated by CMFRI, and which when implemented, would enable most fish to spawn at least once before being caught.
- b. Prohibition on catch of ETP species
- c. Protection of vulnerable species
- d. Control of coastal pollution
- e. Marine habitat restoration - Artificial reefs are known to aggregate fishes and are deployed for the benefit of small coastal fisher communities displaced by the motorized/mechanized sector, who alone has the rights to fish in these areas. Fishes get attracted to the artificial reefs for various reasons like shelter, food or even for breeding purposes. Artificial reefs offer substrate for growth of smaller organisms and there by promoting the growth of smaller and bigger fishes in and around. Artificial reefs, therefore, enhances the biological productivity and fishery resources by serving as sanctuaries and nurseries or breeding grounds. With aggregation of fish, the scouting time is reduced, saving fuel and labour charges.
- f. Restoration of mangrove habitats
- g. Marine leasing policy

### CAPTURE BASED AQUACULTURE

Capture Based Aquaculture (CBA) is the practice of collecting seed materials from early life stages to adults from the wild, and its subsequent on-growing in captivity to marketable size, using aquaculture practices. It is well understood that even-though the hatchery technologies have been developed for many high value species, the technologies still remain to be perfected and hence fish farmers have to depend on 'seed' available from the wild. CBA has developed due to the market demand for some high value species whose life cycles cannot currently be closed on a commercial scale. CBA is an economic activity that is likely to continue to expand in the short term, both for those species currently under exploitation and possibly with others that may be selected for aquaculture in the near future. It is felt that with effective regulations and management practices, the CBA offers good scope and potential for the artisanal and industrial sectors in the years to come.