CMFRI
bulletin 44
Part Two

MARCH 1990

NATIONAL SYMPOSIUM ON RESEARCH AND DEVELOPMENT IN MARINE FISHERIES

MANDAPAM CAMP
16-18 September 1987

Papers Presented
Sessions III & IV

CENTRAL MARINE FISHERIES RESEARCH INSTITUTE
(Indian Council of Agricultural Research)
P. B. No. 2704, E. R. G. Road, Cochin-682 031, India

Central Marine Fisheries Research Institute
40
YEARS
1947-1987

CMFRI
bulletin 44
Part Two
MARCH 1990

NATIONAL SYMPOSIUM ON RESEARCH AND DEVELOPMENT IN MARINE FISHERIES

MANDAPAM CAMP
16-18 September 1987

Papers Presented
Sessions III & IV

CENTRAL MARINE FISHERIES RESEARCH INSTITUTE
(Indian Council of Agricultural Research)
P. B. No. 2704, E. R. G. Road, Cochin-6 82 031, India

Bulletins are issued periodically by Central Marine Fisheries Research Institute to interpret current knowledge in the various fields of research on marine fisheries and allied subjects in India.

Published by
Dr. P. S. B. R. JAMES
Director
Central Marine Fisheries Research Institute
E. R. G. Road
Cochin-682 031, India

Limited Circulation

STATUS OF BRACKISHWATER PRAWN FARMING IN ANDHRA PRADESH

R. Jayaraman, J. Purushotham Sai, V. Subba Rao, K. Joshua and K. R. Ramesh Babu

The Marine Products Export Development Authority Regional Centre (Prawn Farming), Machilipatnam-521 001.

ABSTRACT

Andhra Pradesh is estimated to have 762.51 ha of brackishwater area under prawn culture. Prawn culture in brackishwater ponds as well as in paddy fields converted into prawn ponds is picking up fast in the coastal districts of Andhra Pradesh, especially in East Godavari, Krishna and Guntur districts. There are more than 200 ha of brackishwater areas suitable for prawn culture in West Godavari district alone. More and more are being brought under prawn farming in this district. Semi-intensive culture technology is employed by the fish farmers. The average yield is estimated at 450 kg/ha/crop. This paper presents and discusses the status of prawn culture in Andhra Pradesh, identifies the constraints and suggests strategies for bringing the abudantly available brackishwater areas under scientific prawn culture to increase the yield from these ponds.

INTRODUCTION

Prawn culture ensures very high returns in India. Increasing international demand for penaeid shrimps, especially from Japan and USA, has triggered of commercial penaeid prawn culture in the country rapidly. Prawn culture activities commenced in Andhra Pradesh in late seventies and gained momentum during 1978-81. To start with, some enthusiastic farmers including a big multinational company initiated commercial prawn culture in the state. Soon a big prawn farm measuring 207 ha came into being in West Godavari in 1982. However, these operations could not last long since most of the farms suffered from physical and technical defects. This made the farmers as well as financial institutions wary of prawn culture. Meanwhile some farmers accidentally found that tiger prawn (*P. monodon*) could survive and grow in freshwater ponds and culturing of tiger prawn with Indian major carps became popular, notably in Krishna District. Motivated by high returns (in some areas poor returns from paddy fields encouraged farmers to take up prawn culture also), the farmers started prawn culture on large scale. The success of commercial prawn culture in Krishna, West Godavari, East Godavari and Guntur Districts led to an unprecedented rate of development of prawn culture operations bringing about 1000 ha under prawn farming within a short span of 2-3 years. The state government brought 300 ha under prawn culture. It is estimated that the area under prawn culture during 1986-87 is likely to exceed 2000 ha. Production of pond raised prawns increased from an estimated 1.5 tonnes in 1981-82 to 354 tonnes in 1986-87 and has already started feeding processing plants in Visakhapatnam.

POTENTIAL BRACKISHWATER AREA

The state is endowed with a long coastline (982 km) and its vast brackishwater sources including brackishwater lakes, open estuaries and adjoining low lying swamps have been estimated at 0.2 million ha. The State Department of Fisheries conducted a survey in 1980 covering 64000 ha of low lying areas adjoining open estuaries spread over 176 sites and identified about 17000 ha as suitable for prawn culture. The district-wise distribution of these areas is shown in Table-1.

Table-1. *Area Suitable for Prawn Cuture* (with details of ownership)

Sl. No.	District	Fisheries Department	Revenue Department	Forest Department	Salt Department	Port Department	Private	Total
1.	Srikakulam	136.00	336.00	—	324.20	—	520.00	1316.20
2.	Vijayanagaram	—	0.53	—	—	—	9.47	10.00
3.	Visakhapatnam	—	368.73	—	—	—	351.47	720.20
4.	East Godavari	—	1795.00	1300.00	—	10.00	240.00	3353.00
5.	West Godavari	—	610.00	—	—	—	922.00	1532.00
6.	Krishna	—	5854.00	200.00	—	—	185.00	6239.00
7.	Guntur	—	244.00	1132.00	—	—	—	1376.00
8.	Prakasam	—	580.00	—	140.00	—	100.00	820.00
9.	Nellore	—	1601.00	—	20.00	—	19.00	1640.00
	Total	136.00	11389.26	2632.00	484.20	10.00	2354.94	17006.40

Source: Directorate of Fisheries, Andhra Pradesh.

The State Department of Fisheries survey as well as the report of the TCDC mission which surveyed the brackish water areas in the state in 1981 found that the climate, soil and water quality of the coastal sites are generally favourable for prawn culture.

With the development of pump-fed ponds in elevated areas, deemed to be unfit for pond culture earlier, the farmers, and the State Fisheries Department have in due course of time spotted new suitable brackishwater areas which were not included in the earlier surveys. It is estimated that there would be atleast 20000 ha of such unsurveyed yet suitable government and private sites in the state. There is scope for utilising some of the brackishwater lakes in the state for pen culture or seasonal prawn culture operations.

Area under prawn culture

The rapid development of prawn culture, that became perceptibe in the last few years, in the State is chiefly attributed to the active role of the private sector. The State government and their agencies have also taken up effective steps to bring in more and more area under prawn culture to benefit weaker sections. The district-wise distribution of private sector farms is given in Table-2.

Table-2. *District-wise distribution of private prawn farms in Andhra Pradesh*

Sl. No.	District	Area under prawn culture (ha)
1.	Srikakulam	1.40
2.	Visakhapatnam	25.00
3.	East Godavari	215.35
4.	West Godavari	240.20
5.	Krishna	416.70
6.	Guntur	141.66
7.	Prakasam	3.00
8.	Nellore	5.00
	Total	1048.31

Technology employed and production of pond-raised Prawns

The size of the prawn farms ranges from 1.0 to 50 ha and that of individual ponds varies from 0.4 to 3.0 ha. About 90 per cent of the farms use pumps for filling in the ponds and exchange of water.

An improved extensive prawn culture technology is being widely employed by farmers in the state. Initial fertilisation is done to develop natural food. The stocking density in general is from 8000 to 50000 per ha (mostly tiger prawns) and culture period lasts from 3 to 6 months. Supplementary feeds such as rice bran oil cake, soyabean meal, trashfish, and clam meat are also given.

The production of pond-raised prawns varies from 159 to 500 kg/ha/crop. The estimated total production of pond-raised prawns increased from a mere 1.5 tonnes in 1981-82 to 354 tonnes in 1986-87.

FACILITIES AVAILABLE FOR PRAWN CULTURE

Prawn seed resources

The prawn seed resources in general and those of *P. monodon* and *P. indicus* in particular are abundantly available in the State. Post-larve of these species are comercially exploited in various places such as Ichapuram (Srikakulam District), Vakapadu (Visakhapatnam District), Kakinada and adjacent mangrove areas of Godavari estuary (East Gadavari District), Perumpalom (West Godavari District), Kruthivenu and Machilipatnam (Krishna District) and Repalle (Guntur District). A number of potential areas of prawn seed resources remain to be identified and exploited.

Seeds of *P. indicus* are available in all the brackishwaters of the State in considerable quantities whereas those of *P. monodon* are found in good quantities in Srikakulam, East Godavari, West Godavari, Krishna and Guntur districts only. Tiger prawn seeds are collected mainly during the periods July to September and from November to December, the two peak periods of recruitment. It is estimated that at present about 35 million seeds of the two commercially important species of prawns are collected and supplied to the prawn farmers annually.

Prawn seed collection and supply is a well established trade in the various centres of seed collection, offering part-time employment to several hundred people. The gears used for seed collection, include hand nets, scoop nets, push nets and shooting nets. They are mostly transported in buckets for shorter distance and under oxygen packs for longer distances.

Appropriate land policy

The State government have framed suitable policies for leasing out the brackishwater areas for the benefit of weaker sections of the society like fishermen, persons belonging to SC/ST communities, besides small-scale self-employed entrepreneurs and large firms. The leasing policy of the State government is not only development oriented but takes care of the interests of weaker sections of the society. About 300 ha of brackishwater area have already been released and converted into prawn ponds for the benefit of the down trodden. A number of schemes are being drawn to bring in atleast 1000 ha area under prawn culture for weaker sections in the next few years. There are indications that the State government is likely to release brackishwater sites to technocrats (20%) and large-scale enterprises (20%) shortly.

Power supply

The assured and continuous power supply (except during summer when harvest commences) in the State has encouraged use of pumps to feed ponds with brackishwater irrespective of elevation and tidal amplitude. This has avoided expenses in constructing expensive tide-fed ponds in elevated areas and permitted suitable designs to pump in water. The draining is accomplished by

gravity flow to save money. Thus comfortable power supply is an added advantage for the development of prawn culture in the State.

Technical assistance

Some of the Central and State government organisations in Kakinada played a pivotal role in the development of prawn culture in the State by imparting training in the prawn culture and extending technical assistance to the prawn farmers. The Kakinada centre of CIFE, Bombay and APAU were mainly responsible for the development of prawn seed collection as a trade in some of the coastal districts of the State. The brackishwater unit of the State Fisheries Department, has a contingent of engineers and technical personnel at its Visakhapatnam, Kakinada and Guntur offices and has been involved in surveying brackishwater areas hitherto unnoticed. They also prepared project reports for centrally sponsored as well as State government schemes and drew the master plan for the development of Polekuru area for prawn culture operations. The Central Institute of Coastal Engineering for Fisheries (CICEF), Bangalore has also surveyed considerable brackishwater areas in East Godavari and Krishna Districts and prepared project reports for centrally sponsored schems. With the establishment of a regional centre (prawn farming) at Machilipatnam, the MPEDA came into picture. It has been actively involved in the development of prawn culture in the State with its technical and financial assistance schemes. The role of MPEDA in this context is dealt with separately.

Financial support

Institutional finance (refinanced by NABARD) is made available to a large number of private entrepreneurs for construction of ponds and culture operations. Prawn culture schemes implemented by the State government and their agencies have received considerable financial assistance from the DRDAS, SC Societies/Corporations, BC corporation, State Fisheries Department and nationalised banks. Under Area Development Programme, Central Government's assistance is extended to the State for developing prawn ponds. The MPEDA is extending financial assistance to prawn farmers for construction and operation of prawn culture farms and other related activities.

CONSTRAINTS TO PRAWN CULTURE DEVELOPMENT

The constraints to prawn culture development in the state are discussed under two heads: Specific constraints and General constraints in the state.

Non-availability of government land

Non-availability of the brackishwater site is the major bottleneck in the development of prawn culture in the state. Out of the 17000 ha identified as suitable for prawn culture, 14600 ha (86%) are owned by government departments such as revenue (67.0%), forest (15.4%.) and salt department (3.6%). Forest lands are protected by law and salt lands are earmarked for salt production. Hence, revenue porambokes are available for allotment for prawn culture. The State government has not yet come forward to allow the brackishwater sites under revenue department to the two categories, viz., unemployed persons and entrepreneurs as proclaimed in the G. O. MS No. 286 F & RD (Fish II) Department dated, 11th August, 1980. Even though several entrepreneurs are interested in taking up commercial prawn culture, non-availability of lands dissuade them.

Lack of information on brackishwater sites

There are large stretches of brackishwater sites owned by private parties and government in the various coastal districts not covered hitherto by the earlier survey. Information on the suitability of these sites for prawn culture is lacking. Similarly, information on the suitability of vast expanse of fallow lands located near brackishwater drains and

connected to the sea for prawn culture is not available.

Inadequate tidal amplitude and power problems

The tidal amplitude along the coast of the state is inadequate and ranges from 1.0 to 1.6 m; since most of the suitable coastal sites are in elevated position, use of pumps becomes inevitable.

Despite an assured power supply, prawn farmers find it difficult to get power connections. Getting power supply to the remote coastal sites is costly as the electricity board charges heavily for the line, transformer etc. The status of prawn culture vis-a-vis power supply is yet to be decided by the A.P.Electricity Board. Presently industrial tariff rate are applied to the power supplied to prawn ponds. The concessions enjoyed by agriculturists are not extended to aquaculturists.

Dearth of seed supply

The seed supply is exclusively from natural sources like estuaries. It is seasonal and subjected to vagaries of nature making it unreliable. The farmers plan to stock their ponds in June so as to harvest the first crop in November and restock in December when there is seed supply. Lack of seed supply in June extends stocking upto August or even September delaying the second crop. The problem becomes more severe as more and more areas are being brought under prawn culture. There exists a dearth of tiger prawn seeds and the problem will become acute in the next two or three years.

Non-availability of suitable prawn feed

It is a known fact that no suitable prawn feed, especially for tiger prawns, is available in India. The low yield in prawn farms in the State is attributed to this constraint. Most of the farms use rice bran, and oil cake as no animal meat (trash fish, clam meat etc.) is easily available. It is felt that with a suitable cheap feed, nutritious, stable and abundantly available, the production from prawn ponds could either be doubled or trebled.

Marketing constraints

Important problems in marketing of cultured prawns are: (1) seasonal fluctuation in the price of prawns and (2) exploitation by middlemen who procure the pond-raised prawns from producers and supply them to exporters.

Lack of infrastructural facilities

Most of the brackishwater sites are located in the coastal areas and have no approach roads and bridges to cross creeks, resulting in increase of transport charges for inputs. Lack of drinking water is another major problem.

Competition for brackishwater lands

Increased competition for lands for forestry (sanctuaries), salt manufacturing and connected industry, and tourism is yet another constraint. It may be mentioned here that more than 20,000 ha of brackishwater sites suitable for prawn culture have been handed over to salt manufacturers in the State.

Other constraints

The other important constraints to prawn culture developmet in the State are: (1) technological constraints (lack of knowledge in advanced culture techniques, lack of information on suitable pond design, etc) and 2) shortage of experienced engineers and extension workers in prawn culture.