

Demonstration of scientific farming of flathead grey mullet among tribal fishers of Balasore, Odisha

Rajesh Kumar Pradhan¹, Subal Kumar Roul¹, Biswajit Dash¹, Subhadeep Ghosh² and K. Madhu³

¹Field Centre of ICAR-Central Marine Fisheries Research Institute, Puri-752 002, Odisha

²Visakhapatnam Regional Centre of ICAR-Central Marine Fisheries Research Institute, Visakhapatnam -530 003, Andhra Pradesh

³ICAR-Central Marine Fisheries Research Institute, Kochi-682 018, Kerala

*E-mail: rajeshfrm220@gmail.com

Abstract

The flathead grey mullet *Mugil cephalus* has good market demand in Odisha yet the farming of this fish is minimal. Scientific capture based farming both in cages and coastal saline ponds was initiated under a Tribal Sub-Plan (TSP) programme operated in ICAR-CMFRI and small-scale fishers belonging to Bhumija tribe of Jugadiha village in Balasore district of Odisha were trained for this. 3200 fingerlings of grey mullet of 20-45 g body weight each and measuring 7-18 cm in total length were procured and stocked in ponds during October 2019. Acclimatized seeds were released in square GI cage (6 x 6 m) in November 2019. Feed prepared with wheat flour and ground nut oilcake as well as floating pellet feed was given @ 5% of body weight. After eight months culture period, a harvest of about 480 kg of grey mullet along with 20 kg of various local shrimp species was obtained from the ponds which provide the tribal fish farmers an additional income of ₹153,000 which proved helpful during the economically tough times during COVID-19 pandemic.

Keywords: Mullet, *Mugil cephalus*, cage farming, TSP

Introduction

The flathead grey mullet *Mugil cephalus* Linnaeus, 1758 is a species found in diverse habitats of marine, brackish and even freshwater. The species is hardy and can survive in waters with a wide range of dissolved oxygen levels. The larvae are planktivorous while juveniles and adults feed mainly on detritus and benthic microalgae. In Odisha various fishing gears such as gill nets, cast nets, shore seines and stake nets capture the grey mullets. Among the several species of mullets contributing to the fishery along Odisha coast *M. cephalus* is most sought after as a table fish and commands good market value. Adults are mostly targeted by small-scale fisheries and juveniles collected

from coastal waters and estuaries can be utilized for capture based aquaculture. Even though market demand for mullets in Odisha and neighbouring West Bengal is substantial, the farming is still not widespread. Successful demonstration of the scientific farming of *M. cephalus* in both open sea cage and coastal pond through Tribal Sub-Plan (TSP) and training of the selected members from tribal community engaged in small scale fisheries of Balasore district, Odisha for their socio-economic development was achieved. The important aspects of a successful fish farming venture include suitable site selection, proper designing of cages/ponds, selection of species, proper stocking size and density, feeding and maintenance which was demonstrated during this farming trial.

Mullet farming in cages

Under the Tribal Sub-Plan (TSP) programme of Government of India aimed at the socio-economic development of tribal communities of the country sixteen members of the Bhumija Tribes of Jugadiha Village, Baliapal Block of Balasore District were identified. A self-help group (SHG) named *Nilamadhab Matsyajibi Swayam Sahayak Gosthi* was formed and using locally available seed resources of *M. cephalus* aquaculture in GI cage was initiated. The cage site was located in the Subarnarekha estuary, Balasore having a depth of about 8 m even during low tide. A nursery rearing cum reserve pond of 0.3 ha was arranged for seed acclimatization. The pond was prepared before stocking of seed following the standard methodologies of total drying and ploughing, application of 750 kg of cow dung and saline water nearly 5-8 ppt from the estuary while maintaining the water depth of 1 to 1.5 feet and allowing ten days for growth of natural food in the pond. Later, the water level was increased to 5 to 6 feet and stocked with 3,200 wild caught fingerlings of *M. cephalus* (7-18 cm total length, 20-45 g body weight) procured from a farmer of West Bengal (Fig. 1). Mustard seed oilcake (25 kg) with raw cow dung (10 kg) made to slurry and chemical fertilizers (SSP @ 1.5 kg) was applied at regular interval of 30 days for production of natural food. Seeds were acclimatized to the pond salinity, local condition and artificial feed prior to stocking in cage. Fishes were fed with 5% of their body weight daily in two split doses during early morning and afternoon. Wheat flour, ground nut oil cake with floating artificial pelleted feed (containing 28-30% protein) was used as supplementary feed during the acclimatization in pond.

Cage fabrication, installation, seed stocking, feeding and cage maintenance were demonstrated. All inputs for culture including the square GI cage (6 x 6 m) with al 2 sets of outer, inner and bird protection nets, mooring, floats and surveillance facilities were provided. The cage was moored



Fig.1. Wild caught mullet fingerlings for stocking in cages



Fig. 2. Cage fabrication in progress

with bunch of concrete blocks and acclimatized advanced fingerlings from the rearing pond were sorted and stocked during November, 2019 (Figs. 2&3). Regular fortnightly monitoring of health and growth with all technical support and guidance was extended by the TSP team of ICAR-CMFRI. Exchange of outer and inner nets and cleaning and the daily feeding of fishes was done by the SHG members. A harvest mela organized on 2nd June 2020 provided about 370 kg of *M. cephalus* (each weighing 400 to 650 g). Additional of mixed shrimp species was also harvested from the nursery pond. The catch was sold to the local vendors and auctioning agents at price of ₹280 to 300 per kg and members earned additional income of ₹153,000, helping them considerably by providing an additional livelihood support (Fig. 4,5 & 6).

The activity can also be continued in saline shrimp ponds of adjacent coastal areas as several youth and women show their inclination to adopt the capture based aquaculture of *M. cephalus* when provided with inputs, training and regular monitoring scientifically. The poor and first time fish farmers are also more interested to culture mullet in unutilized ponds rather than cages.



Fig.3. Fixing of nets on cage frame



Fig.4. Harvest in progress



Fig.5. Mullet harvested from cage



Fig.6. *Mugil cephalus* harvested after capture based aquaculture process