

## ECONOMIC PERFORMANCE OF RESERVOIR FISH FARMING (RFF) : A REINVENTED PEN CULTURE SYSTEM INTRODUCED BY DIRECTORATE OF FISHERIES, JHARKHAND TO ADAPT HYDROLOGICAL CHARACTERISTICS OF RESERVOIRS OF JHARKHAND

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**ABSTRACT :** The present paper is an attempt to study the economic performance of a reinvented pen culture technology popularized under the brand name Reservoir Fish Framing (RFF) introduced by the Directorate of Fisheries, Jharkhand in Kake Reservoir in Ranchi through a cooperative management approach. The results revealed that RFF in the Kake reservoir was moderately capital intensive with Rs.13.66 lakh of total investment in fixed inventories. It was further observed that the establishment of an onsite portable hatchery to enable an uninterrupted supply of fish seed captured the major chunk of the investment of about 43.92 per cent with Rs. 6 lakh. The cost of production investigation adopting the cost concept approach showed that Cost A1 accounts for about 91.88 per cent with Rs. 67,629/ha/annum and feed cost was found to be a single major input factor with 50.72 per cent (Rs. 37,333/ha/annum) of the total cost of production which was estimated to be Rs. 73610/ha/annum. The rate of return over different costs revealed that RFF at Kake reservoir was economically sound with gross and net income of Rs.8.24 and Rs.5.42 lakh/ha/annum, respectively. Hence, it can be concluded that RFF at Kake reservoir under cooperative management approach was economically feasible, which was also vindicated by high return per rupee investment which was estimated to be Rs. 11.20. Therefore, the study concludes that RFF model at Kake reservoir has a high potential to be a key technological intervention approach in reservoirs management having high prospects in economically empowering the marginalized communities dependent on reservoirs and recommends its replication in other reservoirs of the country.

**Key words :** Cost concept, economic performance, rate of return, reservoir fish farming.

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### INTRODUCTION

The enclosure culture technologies like cage culture and pen culture system have facilitated in harnessing abundant open water resources for aquaculture production hitherto not possible. The cage culture has its origination from Mekong basin some 200 years back (Ayyappan *et al.*, 2011). However, its commercialization started in the 1950s in Japan and 1970s in Europe and North America (Beveridge, 2004). Similarly, the pen culture origin can be traced from Japan in 1920s and is now widely adopted globally particularly in south-east Asian countries like Philippines (Isreal, 2008). These technologies are proving

to play a pivotal role in fish production when the capture fisheries seem to have a gloomy future due to overexploitation and illegal unregulated unreported fishing activities. The prospects of terrestrial horizontal expansion aquaculture are limited and stymied as a result of mounting pressure on land from the increasing population, which necessitated fisheries scientists to search for alternatives in bridging this gap in which cage culture and pen culture technique has come up as the answer to this problem. The world population is expected to reach 8.5 billion in 2030, 9.7 billion by 2050 and 10.9 billion by 2100 (UN DESA, 2019) and India which is the second most