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## An analysis of socio-economic profile and constraints of the Indian Major Carps (IMC) seed rearing farmers in Thanjavur district, Tamil Nadu

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### Abstract

India is the second largest fish producing aquaculture nation in the world after China. Inland fisheries sector, aquaculture is poised to play a pivotal role in increasing fish production ensuring food security and enhancing the growth in state economy. Indian Major Carp production is an important sector and also contributes at significant in inland fish production of Tamil Nadu. The aim of this study is to understand the socio economic status and constraints of farmers engaged in IMC production in Thanjavur district, Tamil Nadu. It is one of the important districts due to a significant quantity of Indian Major Carp (IMC) production, availability of rich water resources and employment opportunities. In this regard, sample size for this study was 75 and simple random technique was used for primary data collection. Collected information was tabulated and analyzed by suitable statistical tools. The result of socio economic characteristics of IMC rearing farmers revealed that majority of the respondents (40%) were in the 41-50 age class, 53.33 % of farmers educated at high school level, 60 % of farmers had 10 years experience and 62.67 % of farmers had more than three members in the family with the dependency ratio 1:1.82. In IMC rearing, inadequate availability of quality carp seeds was the major constraint faced by the farmers followed by short supply of water and the high cost of supplementary feed. The various constraints are adversely affecting farmers in obtaining expected fish yields and income. So, by solving the constraints faced by the farmers will help to improve the IMC production.

**Keywords:** Indian Major Carp, seed rearing, constraints

### Introduction

Tamil Nadu possesses 3.83 lakhs ha of effective inland water resources comprising of reservoirs, major irrigation tanks, minor irrigation tanks, short seasonal tanks and ponds, rivers, backwaters and derelict water bodies [6]. In Tamil Nadu, IMC farming contributed nearly 90% to the total freshwater aquaculture production [5]. At the same time large number of farmers depends on inland fish production. Therefore, Thanjavur district also has rich water resources such as 750 numbers of Agriculture Engineering Department Tanks (AED tanks) with area of 75 ha, Panchayat Union Tanks of area 2400 ha, rivers / canals of length 1481.6 kms and 400 ha area of FFDA farmer ponds with average production of 2 tonnes / ha / year [2]. Inland fish production from the present study area was 10,006 tonnes and it's indicated that significance contribution in Tamil Nadu fish production [3]. In Thanjavur district, 5,000 numbers of farmers directly depends on inland fish farming for their livelihoods. Moreover present study area has the capacity to produce more IMC seed rearing due to availability of water resources. However the lack of knowledge on socio economic characteristics of IMC rearing farmers as well as their constraints leads to low production in IMC rearing. Hence though notable increase in IMC production from the inland sector was achieved through find out the major constraints and the implementation of suitable management measures for rectifying the constraints, nevertheless, it has had significant impact on the social and economic wellbeing of the farmers over the years. The aim of this study is to understand the socio economic status and constraints of farmers engaged in IMC production in Thanjavur district, Tamil Nadu. Therefore the present study is considered as the important one in this area.

**Materials and Methods**

The study was carried out in the Thanjavur district because it has the improved inland fishery resources and significance level of IMC seed rearing due to the presence of Cauvery river system, irrigation channels, major and minor tanks with a rich fish biodiversity consisting mostly of carps and other varieties such as Cat fish, Murrels, Tilapia etc. Thanjavur district lies in the eastern part of Tamil Nadu. It is situated between 9 ° 50' and 11 ° 25' of the north latitude and 78 ° 44' and 79 ° 25' of the east longitude. Total geographical area of the district is 3,602.86 sq.km. The sample size for this study was 75 IMC seed rearing farmers in the district. The respondents were selected by using simple random sampling procedure [4]. The primary data were collected through personal interview by structured survey schedule. The questionnaire was designed based on the essential socio-economic characteristics (age, education, experience, occupation and family size) and constraints of the IMC seed rearing farmers.

**Tools of Analysis**

Socio-economic status of IMC seed rearing farmers plays a key role in fish production activities. Therefore tabular analysis was used to analyze the socio-economic parameters such as age, farming experience, education, occupation and family size of the IMC seed rearing farmers.

Rank Based Quotient (RBQ) was applied to analyse various constraints as experienced and unveiled by respondent farmers in performing their IMC seed rearing business. The respondents were asked to rank the factors that have probably restrained their performance in obtaining expected outcome in seed rearing.

**Rank Based Quotient (RBQ)**

Rank Based Quotient (RBQ) was used to quantify the constraints encountered by IMC seed rearing farmers. For calculating the Rank Based Quotient (RBQ) given by Sabarathnam (1988), the following formula was used [9].

$$R. B. Q. = \frac{\sum Fi [(n + 1) - i]}{N \times n} \times 100$$

where,

Fi = Number of fishers reporting a particular problem under i<sub>m</sub> rank

N = Number of farmers

n = Number of problems identified

Based on the mean scores, all the factors were arranged in descending order and the most important factor was ranked first and the least important problem was ranked as the last.

**Results and Discussion**

**Socio-economic profile of IMC seed rearing farmers**

In fisheries sector, socio-economic status of fish farmers plays

a key role in fish production activities. The age distributions of the IMC seed rearing farmers are given in Table 1. Majority of the respondents (40%) were in the 41-50 age class followed by 51-60 age groups (25.33%). Experience gives strength and confidence to the farmers to tackle problems in the farm. In the present study, 60% of the respondents had an experience up to 10 years in IMC seed rearing. In addition 26.67% of the respondents had an experience of 11-20 years and about 12% of the respondents had an experience of 21-30 years.

All the IMC seed rearing farmers in Thanjavur district were literate. Therefore majority of the respondents (33.33%) had their education up to high school level followed by collegiate 21.33%, higher secondary 20%, middle school 16% and primary 9.33%, respectively. The majority of seed rearing farmers were having medium size family (62.67%) followed by large (29.33%) and small family (8%). The majority of small family had the high dependency ratio (2.00) followed by medium (1.82) and large family (1.32) (Table 1).

Table 2 shows that the occupational status of the IMC seed rearing farmers. About 18.67% of them had carp seed rearing as their primary occupation. The remaining respondents had agriculture (81.33%) as their primary occupation. About 81.33% of them practiced IMC seed rearing as their secondary occupation.

**Table 1:** Socio economics characteristics of the IMC seed rearing farmers

S. No	Factors	Number of farmers	Percentage
<b>Age distribution</b>			
1	21-30	03	04.00
2	31-40	16	21.33
3	41-50	30	40.00
4	51-60	19	25.33
5	61-70	07	09.33
	Total	75	100
<b>Educational status</b>			
1	Primary school	7	09.33
2	Middle school	12	16.00
3	High school	25	33.33
4	Higher secondary school	15	20.00
5	Collegiate	16	21.33
	Total	75	100
<b>Experience</b>			
1	0-10	45	60.00
2	11-20	20	26.67
3	21-30	09	12.00
4	31-40	01	01.33
	Total	75	100
<b>Family size</b>			
1	Small (1-3)	6	08.00
2	Medium (4-5)	47	62.67
3	Large (above 5)	22	29.33
	Total	75	100

**Table 2:** Occupational status of farmers

S. No	Occupation of the respondents	Status			
		Primary		Secondary	
		Number of farmers	Percentage	Number of farmers	Percentage
1	Aquaculture	14	18.67	61	81.33
2	Agriculture	61	81.33	14	18.67
	Total	75	100.00	75	100.00

### Constraints of IMC seed rearing farmers

In the present study fourteen constraints were considered that would affect the IMC seed rearing farmers. That constraints were inadequate availability of quality carp seeds, short supply of water, high cost of supplementary feed, high cost of electricity tariff, non availability of skilled labour, prevalence of disease outbreak in culture ponds, low farm gate price, low net returns, problem of direct selling to buyers, poor quality of carp seeds, tied sale, high mortality during culture period, low productivity and poaching (Table 3) were analysed in this study.

**Table 3:** Constraints of IMC seed rearing farmers

Constraints	Mean score	Rank
Inadequate availability of quality carp seeds	87.24	I
Short supply of water	79.33	II
High cost of supplementary feed	78.76	III
High cost of electricity Tariff	71.62	IV
Non availability of skilled labour	64.19	V
Tied sale	48.95	VI
Prevalence of disease outbreak in culture ponds	45.81	VII
Poaching	44.57	VIII
High mortality during culture period	43.62	IX
Low farm gate price	41.43	X
Problem of direct selling to buyers	38.00	XI
Low productivity	36.29	XII
Poor quality of carp seeds	33.90	XIII
Low net returns	29.24	XIV

The results revealed that among the fourteen constraints inadequate availability of quality carp seeds was the first major constraint faced by the IMC seed rearing farmers with the mean score of 87.24. Moreover same problem was greater hurdle for the development of freshwater aquaculture reported by Singh and Ahmad (2003). Therefore the present study explains that rectifying this problem by suitable measures will help to improve the IMC production. The second and third places were occupied by the problem of short supply of water and high cost of supplementary feed with the mean score of 79.33 and 78.76, respectively [10]. Rahaman *et al.*, (2013) identified theft and pilferages, non availability of quality fish seeds, lack of government support both technically and financially, high degree of perishability of the product, cut throat competition, inconsistent supply of fish and lack of storage facility as the major constraints in production and marketing of fishes [8].

### Conclusion

The NGOs and the government authorities should ensure for at least the basic level of education, health, sanitation, nutrition status, rights and training for the IMC seed rearing farmers. It would facilitate the generation of additional employment opportunities, income and livelihood development of carp farmers and consumers. Addressing the constraints identified and adoption of the strategies suggested would help to increase the production. Quality brood stock should be made available to the carp seed producers will help to produce genetically good quality seeds and to enhance the production of IMC farmed carps significantly even in domestic markets and exports.

### Recommended strategies to rectify the constraints in IMC seed rearing

1. Government should construct village tanks and store

excess rain water during monsoon period to ensure water supply during dry periods.

2. The government should take initiative to fix a suitable price for carp seeds in consideration with the cost of production and quality.
3. A comprehensive policy on carp seed production in the state as well as a national fisheries policy would obviate most of the constraints faced by the industry.
4. Most of the farmers are not aware of genetic aspects of carp seed breeding. The Government should arrange awareness campaigns among the carp seed producing farmers to avoid inbreeding of brood fish.

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