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An Analysis of Socio-economic, Marketing and Management Constraints Faced by Beneficiaries after the Integrated Fisheries Development Scheme in Khammam District of Telangana

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Authors' contributions

This work was carried out in collaboration among all authors. Author KKM carried out the research through personal interviews, performed the statistical analysis and wrote the first draft of the manuscript. Authors IKT and KS conceptualized and designed the study and suggested the statistical analysis. Author MSP helped in finalizing the sampling frame and guided in analyses of the study and literature. Author KS read and corrected the statistical analysis. All authors read and approved the final manuscript.

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ABSTRACT

Aims: This study typically aims to analyze the multifaceted challenges faced by fishers who are the beneficiaries of the Integrated Fisheries Development Scheme (IFDS) in Khammam District of Telangana.
Study Design: Ex-post facto research design was used for the study and revealed the constraints faced by beneficiaries after IFDS.
Place and Duration of Study: The study was held in Khammam district of Telangana. In Khammam district top 5 mandals with the highest number of beneficiaries were selected for the study. The study lasts from April to May 2024.
Methodology: A three-stage random sampling technique was selected for the study with a sampling population of 120 beneficiaries. A well-structured pretested interview schedule was prepared that includes major constraints faced by respondents regarding socio-economic, marketing, and management challenges they faced after IFDS. The constraints were selected from previous literature. Based on ranks given to the listed constraints by respondents, the ranks were analyzed and conclusive results were drawn by using Garette's ranking Technique.
Results: The prime constraint with higher mean score values identified in these categories are in socio-economic constraints where problems in availing loans and insurance with mean score values of 72.06 and 66.31 respectively. In marketing constraints, Lack of proper market infrastructure (73.31) and Lack of processing facilities (61.61) were observed as major constraints. In management constraints, prime constraints observed were the high cost of material inputs (72) and high labor cost (59.91). Along with these major constraints some minor constraints were also identified in the study.
Conclusion: Through a comprehensive examination of these constraints, the study seeks to offer insights that can assist policymakers, practitioners, and stakeholders in developing strategies to address the challenges encountered by beneficiaries of IFDS in the Khammam district of Telangana. This could potentially have a significant impact on fish productivity and the livelihood of fishers across the state.

Keywords: Fishers; constraints; IFDS; marketing; socio-economic; management; Garette's rank.

1. INTRODUCTION

India is the world's second-largest aquaculture nation, after China. The Blue revolution in India emphasized the importance of the fisheries and aquaculture industry. The industry is expected to play an important role in the Indian economy in the near future. Indian fisheries have shifted from a reliance on coastal fisheries to inland fisheries, which now account for 70% of fish output, up from 36% in the 1980s. Inland fisheries have shifted from capture to culture-based, resulting in a sustainable blue economy. India's inland fish output has increased significantly, from 7.5 lakh tonnes in 1950-51 to the current level production of production of 131.95 lakh tonnes in 2022-23. Until 2000, marine fish output dominated India's overall fish production in India, but now inland fisheries account for 70% of overall fish output, owing to scientific practices.

The top inland fish-producing states are Andhra Pradesh (45.06 lakh tonnes), West Bengal (18.56 lakh tonnes), Uttar Pradesh (9.15 lakh tonnes) and Odisha (8.39 lakh tonnes). Telangana ranks ninth in the country with the production of 4.38 lakh tonnes in 2022-23. MoFAHD [1].

Fisheries is one of the fast-growing sectors generating income and employment in the state of Telangana. Aquaculture spreads over more than 1000 ha area in the Telangana. A rich human resource pool of 27.14 lakh population comprising stakeholders who are organized into about 4000 Fishermen societies with about 3 lakh members spread over in the entire state. The sector contributes 0.6 percent to the GSDP and plays an important role in the overall socio-economic development of fisher families in Telangana by improving their living standards

and providing sustainable livelihood. The inland fish production in the state has consistently risen from 2.7 lakh tonnes in 2017-18 to present production of 4.38 lakh tonnes in 2022-23. In the state, during 2023 the top five major fish-producing districts were Nalgonda (29,488 tonnes), Nirmal (22,137 tonnes), Medak (21,963 tonnes), Nizamabad (21,791 tonnes) and Khammam (19,496 tonnes) [2]. As Khammam was consistently performing over a few years which reflects the scope of the study in the area.

Telangana government launched Integrated Fisheries Development Scheme (IFDS) on 5th September 2018 with a budget outlay of Rs. 1000 crore considering the consistent performance of fisheries in the state and to encourage the fisheries. The main objective of this programme is to develop fish production in the state and raise the living standards of fishers. Under this scheme, the government spent the allocated amount for fisheries development and provided subsidies on the cost of material inputs to the beneficiaries. The state had established 14 numbers of freshwater fish seed hatcheries, constructed fish culture ponds covering 673 ha of area, established fish seed rearing units covering 85 ha, and 24 pen culture units. It also established 25 re-circulatory aquaculture systems and 160 cage culture units under this scheme. The government had created the required infrastructure and assets for the development of fishers by distributing vending units with 2 and 4-wheelers for marketing, fishing nets, boats, fish food kiosks, wholesale and retail markets, landing centers, ice plants, fish feed mills, fish processing units, ornamental fish units, laboratories, training centers, etc., where 1,18,000 fishers got benefitted under this scheme (NFDB, 2021).

Despite its outstanding performance in terms of state GSDP and social security, fishers confront a number of socioeconomic issues, including difficulties in obtaining loans and insurance, a lack of information about welfare schemes, a poor connection with the fisheries department etc., Marketing constraints including a lack of sufficient market infrastructure, processing facilities, Pest and disease outbreaks, high labor and input costs, low fish quality, and so on are among the constraints facing fisheries management.

Hence, the present study attempted to find out the major challenges faced by beneficiaries of IFDS related to socio-economic, marketing, and management in the Khammam district of Telangana.

2. MATERIALS AND METHODS

This study utilized the list of IFDS beneficiaries in Khammam district in its sampling frame. In IFDS nearly 97% of fishers in Khammam benefit from two sub-schemes: crafts and nets, and vending units with mopeds. A multistage random sampling procedure will be used to choose selected fishers. In the first stage of the sampling technique, out of the 33 districts of Telangana state, the Khammam district of Telangana state is purposively selected in the study, as it has consistently performed well in fish production over last five years. It ranked fifth position in fish production during 2022-23, which reflects the scope for expanding fish production in the district. In the second stage of sampling, the top five mandals based on a number of beneficiaries been were selected from each schemes sub-scheme. In the third stage of sampling, the top two villages from each mandal been were identified, and six farmers from each village were selected randomly. Thus, 60 beneficiaries were selected from each sub scheme amounting to an overall sample size of 120 fishers.

2.1 Henry's Garette Ranking Technique

Garette's ranking technique was used to find out the constraints faced by beneficiaries. Beneficiaries were asked to assign the rank for all the socioeconomic, marketing, and management constraints faced by them, and the percent position of Garette value was calculated by the formula:

$$\text{Percent position} = \frac{100(Rij-0.5)}{Nj}$$

Where,

R_{ij} = Rank given for the i^{th} variable by j^{th} respondent,

N_j = Number of variables ranked by j^{th} respondent

After determining the percent position using the formula, the corresponding value was selected from Garrett's chart for each calculated percent position. Then, the ranks were replaced by Garrett's chart values for each rank. Finally, the average mean score for each statement was calculated. The statements with the highest mean score were assigned the highest rank.

3. RESULTS AND DISCUSSION

A pre-tested interview schedule was prepared for primary data collection and constraints faced by the respondents were recorded using the personal interview method. There were three major categories of constraints observed among the beneficiaries of IFDS *viz*., Socio-economic, marketing and fisheries management constraints. Based on the responses of fishers who are the beneficiaries of IFDS the constraints were analyzed using Garett's ranking technique and discussed below.

3.1 Socio-Economic Constraints Faced by Beneficiaries of IFDS

In the study area, six major socio-economic constraints were taken for the study from previous studies. Then percent position for the six major constraints was calculated by using the formula which was represented in Table 1. Based on percent position, Garett's value was seen from the Garett's chart. After the average mean score was calculated the ranking was given accordingly. Six major socio-economic constraints identified were Problems in availing the loan, Problems regarding availing insurance, Lack of awareness about welfare schemes, the small size of land holding, Low literacy level, and Lack of rapport fisheries department. Based on the responses given by respondents, the major constraint observed was a problem in availing loans with an average mean score of 72.06. It was found that there is no access to credit to fishers after IFDS which mainly acts as a source of investment for the fisheries. Also, this constraint was significantly found in the study [3]. The second major challenge that was faced by fishers was regarding availing the insurance with a mean score of 66.31. As insurance is one of the main methods to manage risks there is no proper insurance facilities that are available to fishers after IFDS and beneficiaries reported that previously subsidized premiums were also not credited. The third major constraint that concerned was the Lack of awareness about welfare schemes with an average mean score of 53.61. There are no welfare schemes that are available to fishers after IFDS due to which they were lacking in development and saving from fisheries activities. Other constraints like the small size of land holding, Low literacy level, and Lack of rapport with fisheries management were observed with a mean score of 43.91, 32.48, and 30.60 respectively, which were represented in Table 2. As fishers in the study area solely depend on the fisheries they have no other source of income like agriculture activities, The least problem observed regarding

Table 1. Percent position of Socio-economic constraints

Ranks	Percent Position $\frac{100(Rij-0.5)}{Nj}$	Garette Value
1	$\frac{100(1-0.5)}{6}$ = 8.33	77
2	$\frac{100(2-0.5)}{6}$ = 25	63
3	$\frac{100(3-0.5)}{6}$ = 41.66	54
4	$\frac{100(4-0.5)}{6}$ = 58.33	46
5	$\frac{100(5-0.5)}{6}$ = 75	36
6	$\frac{100(6-0.5)}{6}$ = 91.66	23

Table 2. Socio-economic constraints faced by beneficiaries of IFDS

SL No.	Socio-Economic Constraints	Mean Score	Rank
1	Problem in availing the loan	72.06	I
2	Problems regarding availing insurance	66.31	II
3	Lack of awareness about welfare schemes	53.61	III
4	The Small size of land holding	43.91	IV
5	Low literacy level	32.48	V
6	Lack of rapport with the fisheries department	30.60	VI

Table 3. Percent position of marketing constraints

Ranks	Percent Position $\frac{100(Rij-0.5)}{Nj}$	Garette Value
1	$\frac{100(1-0.5)}{6}$ = 8.33	77
2	$\frac{100(2-0.5)}{6}$ = 25	63
3	$\frac{100(3-0.5)}{6}$ = 41.66	54
4	$\frac{100(4-0.5)}{6}$ = 58.33	46
5	$\frac{100(5-0.5)}{6}$ = 75	36
6	$\frac{100(6-0.5)}{6}$ = 91.66	23

Table 4. Marketing constraints faced by beneficiaries of IFDS

Sl No.	Marketing Constraints	Mean Score	Rank
1	Lack of proper market infrastructure	73.31	I
2	Lack of processing facilities	61.61	II
3	Lack of access to quality control mechanisms	55.03	III
4	Inadequate storage and preservation facilities	41.85	IV
5	Involvement of middlemen in selling fish	36.89	V
6	Lack of proper transportation facilities	30.29	VI

Table 5. Percent position of Fisheries Management constraints

Ranks	Percent Position $\frac{100(Rij-0.5)}{Nj}$	Garette Value
1	$\frac{100(1-0.5)}{5}$ = 10	75
2	$\frac{100(2-0.5)}{5}$ = 30	60
3	$\frac{100(3-0.5)}{5}$ = 50	50
4	$\frac{100(4-0.5)}{5}$ = 70	40
5	$\frac{100(5-0.5)}{5}$ = 90	25

Table 6. Fisheries management constraints faced by beneficiaries of IFDS.

Sl No.	Fisheries Management Constraints	Mean Score	Rank
1	High cost of material inputs	72	I
2	High labour cost	59.91	II
3	Incidence of pest and diseases	43.08	III
4	Poor quality of fish	42.75	IV
5	Lack of proper packaging facilities	32.25	V

socio-economic constraints was the lack of rapport with the fisheries department. The fisheries department in Khammam was conducting training programme regularly and there found good rapport with the fishers.

3.2 Marketing Constraints Faced by Beneficiaries of IFDS

The major marketing constraints faced by fishers were Lack of proper market infrastructure, Lack of processing facilities, Lack of access to quality

control mechanisms, Inadequate storage and preservation facilities, Involvement of middlemen in selling fish, and Lack of proper transportation facilities. Then percent position was identified for each rank by using Garette's formula which was represented in Table 3. After calculating the percent position mean score value was calculated then following results were obtained. The most significant issue was the lack of proper market infrastructure, with a mean score of 73.31, indicating a critical need for development in this area. Following this, the lack of processing facilities with a mean score of 61.61 was identified, which highlights a significant gap in the ability to value-added and preserve fish products. Access to quality control mechanisms also presents a notable challenge, with a score of 55.03, which affects the ability to maintain product standards. Inadequate storage and preservation facilities, scoring 41.85, indicate the inefficient preservation of fish, leading to higher spoilage rates findings were in confirmative with the study [4]. The involvement of middlemen in selling fish, with a score of 36.89, indicates the issues in the supply chain that could reduce profitability for primary producers. Lastly, the lack of proper transportation facilities, with a score of 30.29, underscores logistical challenges that impede efficient market access. Addressing these constraints in order of their severity can significantly improve the efficiency and profitability of the fish market in the study area.

3.3 Fisheries Management Constraints Faced by Beneficiaries of IFDS

Five major constraints were observed in management constraints. There were incidences of pest and diseases, high labour costs, poor quality of fish, lack of proper package facilities, and high cost of material inputs. As mentioned earlier percent position was calculated by using Garette's formula which was observed in Table 5. Then by calculating the mean ranking was given accordingly. The primary constraint in fisheries management was the high cost of material inputs, which scores 72, indicating it is the most significant issue impacting the fisheries sector as inputs involve fish seed, nets, and so on Kanaga et al. [5]. Closely following is the high labor cost, with a score of 59.91, which reflects the substantial expenses associated with workforce requirements. The incidence of pests and diseases, scoring 43.08, suggests a serious threat to fish health and productivity. The poor quality of fish, with a score of 42.75, could be attributed to low-quality fish seed such that which was not seen at the time of IFDS. The findings were in the line with the study Uttej et al. [6] that this constraint mainly suggests ongoing challenges in maintaining and overcoming the high standards for fish products. According to Raj et al. [7], lack of training in the care and management of fingerlings at the initial stages is one of the reasons for the poor quality of fish Finally, the lack of proper packaging facilities, scoring 32.25 highlights the deficiencies in packaging that affect the marketability and shelf-life of fish products. Addressing these constraints is essential for enhancing the efficiency, productivity, and overall sustainability of fisheries management [8].

4. CONCLUSION

In conclusion, the analysis of various challenges in the fisheries sector reveals critical socio-economic, marketing, and management constraints. Socio-economic issues such as difficulties in availing loans and insurance; as well as lack of awareness about welfare schemes significantly impede the financial stability and growth potential of the fisheries sector. Marketing constraints, such as inadequate market infrastructure and processing facilities, highlighted the need for substantial improvements in market access and product value addition. Additionally, fisheries management is severely affected by high input costs and labor expenses, coupled with issues like pest and disease incidence and poor fish quality. It requires concerted efforts from stakeholders to improve financial support, infrastructure and management practices about fisheries by addressing these highlighted multifaceted constraints, which would be crucial for fostering a more resilient and profitable fisheries sector.

DISCLAIMER (ARTIFICIAL INTELLIGENCE)

Author(s) hereby declare that NO generative AI technologies such as Large Language Models (ChatGPT, COPILOT, etc) and text-to-image generators have been used during writing or editing of manuscripts.

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COMPETING INTERESTS

Authors have declared that no competing interests exist.

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