Constraints in Production and Marketing in Perception of Fish Farmers and Market Intermediaries of Inland Fisheries in Khammam District of Telangana State, India

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Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

Original Research Article

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ABSTRACT

The study focuses on Khammam district in Telangana, a significant region for fish farming. Using primary data collected through personal interviews with fish farmers (60) and market intermediaries. The present study aims to identify the constraints in fish production and status of marketing using Garrett's ranking technique. The major constraints in fish production were identified include high feed costs (Garrett score- 71.41), lack of market facilities (68.55), and inadequate capital (68.15). For marketing, addressing the key issues include high price fluctuation (60.4) in the fishes, high transportation costs (56.13), and lack of market infrastructure (53.53).These results point to important issues that must be resolved in order to increase the productivity and sustainability of fish farming and marketing. The most significant difficulties are those concerning infrastructure, such as lack of market facilities and high transportation costs, along with financial limitations like high feed costs and insufficient money. Addressing these challenges is essential for enhancing the fisheries sector contribution to food security and economic development, particularly in the regions of Khammam District in Telangana

1. INTRODUCTION

Fish is a nutrient-dense food that plays a crucial role in maintaining a healthy and balanced diet, offering a range of health benefits. It is an excellent source of protein, long-chain omega-3 polyunsaturated fatty acids, and various micronutrients. Globally, fish and fishery products are vital for food and nutritional security, providing high-value proteins, essential micronutrients, and long-chain omega-3 fatty acids (FAO,2020). Although the average global daily consumption of fish and fish products is only about 34 calories per capita, they make a significant contribution to daily protein requirements, with a 150g serving meeting 50-60% of an adult's needs.

India's fish production is notable for its efficiency, with fish having a higher feed conversion rate, better protein retention, and lower cholesterol content compared to other protein sources. Currently, around 35% of the Indian population consumes fish, with a per capita availability of over 13 kg per year as of 2022-23. This is still below the World Health Organization's recommended level of 20.5 kg per capita for nutritional security. Fisheries are a crucial source of food, income, nutrition, and livelihood for millions of people worldwide. In India, Blue revolution had a pioneering impact on the fisheries sector which demonstrated more importance of fisheries and aquaculture sector. This sector is considered as a sunrise sector and is poised to play a significant role in the Indian economy in near future reached 8.92% of the global total in 2022-2023, with a record 175.45 lakh tonnes produced in FY 2022-23, including

44.32 lakh tonnes of marine and 131.13 lakh tonnes of inland fish [1-3]. The fisheries sector significantly contributes to the national economy, with a GVA of Rs. 1,37,716 crores in 2020-2021 and a provisional production of 16.25 MMT in 2021-22. India is the second-largest producer of aquaculture fish globally, after China. Inland fish production accounts for about 75% of the country's total, with a notable shift from capture fisheries to aquaculture over the past 25 years. Freshwater aquaculture's share in inland fisheries has risen from 34% in the mid-1980s to around 76% recently. Fisheries is one of the fast growing sectors generating income and employment in the state of Telangana [4,5]. The sector is contributing 0.6 percent to the GSDP and plays an important role in the overall socio-economic development of fisher families in Telangana by providing nutrition & food security Despite the overall growth of India's fisheries sector, research on the specific constraints faced by fish producers and marketers in Khammam district is limited [6-8]. Existing studies often neglect the unique challenges within smaller districts, leading to generalized policy recommendations [9,10]. This study aims to identify and analyze the primary constraints in fish production and marketing in Khammam, assess their impact on the sector's efficiency and sustainability, and propose actionable strategies to address these issues.

2. MATERIALS AND METHODS

The study was based on primary data and collected through personal interview method from fish farmers and market intermediaries like wholesalers, retailers, vendors with the help of

well-structured and pre-tested schedule exclusively designed for the study . The present study was conducted in Khammam district of Telangana. Fish farming is one of the significant sources of livelihood in Khammam District. It not only provides food security but also contributes to the economic development of the region. Approximately 9.93% of the total fish farming population in Telangana hail from Khammam district, positioning it as the second-most prominent district in the realm of aquaculture, boasting an expansive area of 132.176 ha. To address the dispersed distribution of fish farmers in Khammam district, this study utilized a snowball sampling technique. We started by identifying and interviewing a few key individuals in the fish farming and marketing sector. These initial contacts were then asked to refer other participants. Through this chain referral process, we built a sample comprising 60 fish farmers, 10 wholesalers, 10 retailers, and 10 vendors. Data was collected via structured interviews with these participants to explore the constraints and challenges in fish production and marketing.

To find out the constraints in production and marketing of fishes in the region. We were used Garrett's ranking technique. The respondents will be asked to rank the various problems and these ranks will be converted into percent position by the formula

$$Percent\ position = \frac{100(R_{ij} - 0.5)}{N_j}$$

Where,

R_{ij}= Rank given for the ith variable by j^{th} respondents
N_j= Number of variables ranked by j^{th} respondents

From the Garrett's Table, the percent position calculated is converted into scores. Then for each factor, the scores of each individual are added and then total value of scores and mean values of score is calculated. The factors having highest mean value is considered to be the most important factor.

3. RESULTS AND DISCUSSION

Opinion survey was carried out to know the constraints faced by the respondents in the production and marketing of the fish in the study area and the data were analysed with the help of Garrets ranking technique. During the survey we were identified the eight problems in fish production from the fish farmers such as inadequate capital for the farming, water availability, high feed costs, disease outbreak ,lack of market facilities , lack of technical knowledge for the production , price fluctuations, high seed costs , lack of input suppliers in local. And for the marketing of the fish major constraint are identified are high transportation cost ,high commission charges , high price fluctuations, storage problem ,inconsistent supply of fish , lack of government support in market facilities, lack of infrastructure in market ,shifts in consumer preference etc . Constraints faced by the respondents were ranked according to garrets score.

The constraints in fish production expressed by the farmers were ranked based on the results of Garret ranking analysis and listed in Table 1. From the nine constraints high feed cost (Garrets score-71.41, Rank I) is identified as the most severe constraint, indicating that high feed cost are the biggest challenge faced by the fish farmers. It suggests that feed costs significantly impact the profitability and sustainability of the operations. Lack of Market Facilities (Garrets score -68.55, Rank II) is the second most critical issue is the lack of market facilities. This indicates problems with the infrastructure needed to sell products, possibly leading to inefficiencies

Table 1. Constraints faced by fish farmers during fish production in the Khammam district of Telangana in 2024

Sl.No	Constraints	Garrets score	Rank
1	High feed costs	71.41	I
2	Lack of market facilities	68.55	II
3	Inadequate capital	68.15	III
4	Disease infestation	51.08	IV
5	Lack of input suppliers	46.8	V
6	Water availability	43	VI
7	High seed costs	36.38	VII
8	Price fluctuations	32.83	VIII
9	Lack of technical knowledge	31.78	IX

Table 2. Constraints faced by the market intermediaries in marketing the fish

SI.No	Constraints	Garrets score	Rank
1	High price fluctuation	60.4	I
2	High transportation costs	56.13	II
3	Lack of infrastructure in market	53.53	III
4	Storage problem	52.9	IV
5	Inconsistent supply of fish	50.73	V
6	Lack of government support	44.03	VI
7	Shifts in consumer preference	43.93	VII
8	High commission charges	39.33	VIII

and reduced market access for producers. Inadequate Capital (Garrets score-68.15, Rank III) Inadequate capital is ranked third, showing that limited financial resources are a major barrier. This could affect the ability to invest in necessary inputs, technology, or expansion efforts.Disease Infestation (Garrets score-51.08 , Rank IV) Disease infestation is a significant concern but less critical than the top three constraints. It highlights health issues that can affect productivity and necessitate spending on treatments or preventive measures. Lack of Input Suppliers (Garrets score-46.8 ,Rank V).The fifth constraint is the lack of input suppliers, suggesting challenges in obtaining essential supplies such as fish seeds, fertilizers, and equipment, which can hinder production efficiency and effectiveness .Water availability (Garrets score -43 , Rank VI) is a mid-level constraint. This indicates issues with accessing sufficient water for production needs, which could affect both the quantity and quality of output. High seed cost (Garrets score 36.38 - Rank VII) .High seed costs are a lesser but still notable constraint. This impacts the initial investment needed for planting, potentially limiting the scale of production or the ability to choose high-quality seeds. Price Fluctuations (Garrets score-32.83, Rank VIII) Price fluctuations are a concern, less severe compared to the others. This indicates that unstable market prices can affect income predictability and financial planning. Lack of technical knowledge (Garret score-31.78,Rank IX)The least severe constraint is the lack of technical knowledge. While still an issue, it suggests that improving technical know-how could be a relatively lower priority compared to addressing financial and infrastructural constraints. Overall, suggested that financial constraints (high feed costs, inadequate capital) and infrastructural issues (lack of market facilities) are the most pressing problems, whereas technical knowledge is relatively less of a concern.

The analysis of constraints impact the market reveals several significant challenges ranked by market intermediaries based on Garrett's score in Table 2. The most critical issues we found is high price fluctuation, with a score of 60.4, indicating it as the top-ranked constraint (I). This is closely followed by high transportation cost, which scored 56.13, making it the second most issue (II). The third major constraint is lack of infrastructure in the market, with a score of 53.53 (III). Storage problems also pose a significant challenge, ranking fourth with a score of 52.9 (IV). The inconsistent supply of fish, scoring 50.73, is the fifth-ranked constraint (V). Lack of government support, with a score of 44.03, is ranked sixth (VI), while shifts in consumer preference, scoring 43.93, rank seventh (VII). Although high commission charges were mentioned, they were not assigned a score and rank, this results suggesting that they might be less significant or not fully assessed in this analysis. Overall, these constraints highlight critical areas that need addressing to improves market efficiency and stability

4. CONCLUSION

The present study conducted that in Khammam district of Telangana identifies key constraints in fish farming and marketing. For fish farmers, high feed costs are one the most severe issue, followed by lack of market facilities and inadequate capital. Other significant constraints include disease infestation, lack of input suppliers, water availability, high seed costs, price fluctuations, and lack of technical knowledge. Market intermediaries highlighted high price fluctuations, high transportation costs, and lack of market infrastructure as major challenges. Storage problems, inconsistent supply of fish, lack of government support, and shifts in consumer preference were also notable issues .Addressing these financial and infrastructural constraints through targeted policies, financial support, and infrastructure

development is crucial. Enhancing technical knowledge and support services can further mitigate production challenges. Focusing on these areas will improve the efficiency, stability, and sustainability of the fishery sector, contributing to food security, economic development, and livelihoods in the Khammam District.

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.

ACKNOWLEDGEMENT

I am very thankful to my guides for their help and guidance during this research. Their support and advice made this work possible.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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Peer-review history:
The peer review history for this paper can be accessed here:
https://www.sdiarticle5.com/review-history/121366