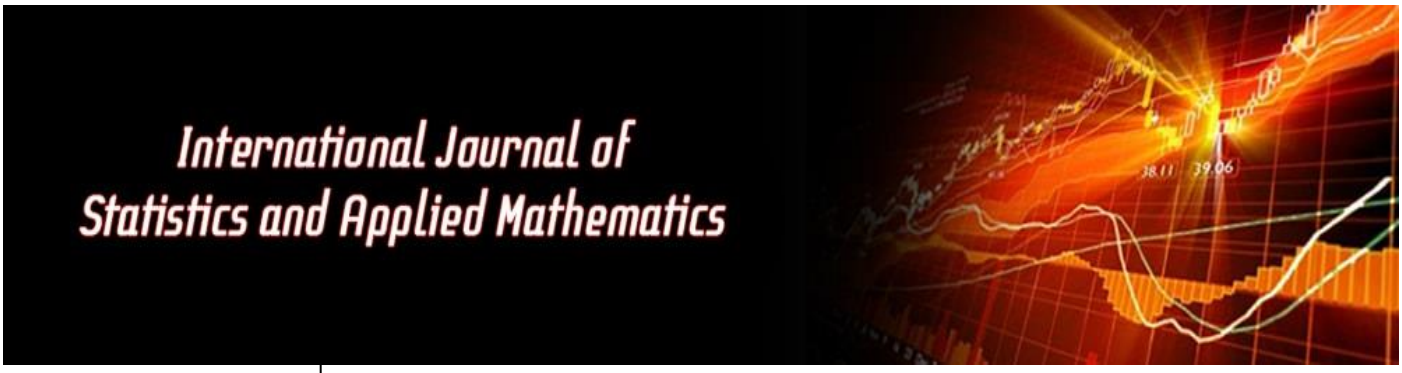

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Fishermen in Telangana State: Their constraints and suggestions

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Abstract
The study was conducted at six districts of Telangana state *viz.* Karimnagar, Kamareddy, Medak, Wanaparthy, Mahabubabad and Yadadri Bhuvanagiri during 2019-2022 to find out the constraints faced by the fishermen in fishing activities. Forty fishermen were selected from each of the selected districts using simple random sampling technique thus constituting 240 fishermen. A structured questionnaire was used to collect responses about constraints faced and related information specifically based on preliminary survey as well as focus group discussions. The major constraints faced by fishermen were untimely and low quality fish seed stocking by government, improper functioning of state seed farms and insufficient seed production, erratic fluctuation in the price of fish, government grants are not properly distributed, dominance of middlemen in marketing and lack of co-operation among members of society. The suggestions listed by fishermen were timely stocking of bigger size quality fingerlings, elimination of over exploitation from middlemen/ commission agents/ traders, provision of skill training for overall development of fishermen, providing fair price for the catch and awareness creation among the fisher folk about government policies and programmes.

Keywords: Inland fisheries, fishermen, fisheries schemes, adoption, scientific practices

Introduction
Fishery holds significant economic importance in India, constituting a thriving sector characterized by diverse resources and potentials. India stands as the world's third-largest fish producer and the second-largest in aquaculture, trailing only behind China. This industry plays a crucial role in providing food, nutrition, employment, and income, particularly for rural communities. Approximately 25 million individuals engaged in fishing and fish farming benefit at the primary level, with double that number involved along the value chain.

While there has been absolute growth in inland fisheries and aquaculture, the sector has not fully realized its potential. The extensive inland aquatic resources present immense opportunities for increased production, fostering livelihoods, and promoting economic prosperity.

Telangana, established as the 29th state of India on June 2, 2014, relies significantly on fisheries as a traditional occupation. This sector sustains around 500,000 families in the state and serves as a vital source of nutritional food. Fisheries contribute substantially to Telangana's economic growth, accounting for 0.6 percent of the Gross State Domestic Product (GSDP) and playing a crucial role in the socio-economic development of fishing communities by ensuring nutrition and food security.

In Telangana, inland fisheries have predominantly focused on capture fisheries in reservoirs and tanks under a lease/license system. Recent initiatives, such as improving irrigation and drinking water facilities through projects in the Krishna and Godavari river systems, including Mission Kakatiya, emphasize enhancing water storage capacity in water bodies. This effort has led to an increase in the water spread area to 7.76 lakh hectares. Consequently, fish production has surged from an estimated 1.93 lakh tonnes in 2016-17 to 2.94 lakh tonnes in 2018-19, positioning the state among the top five inland fish-producing states in the country.

Review of Literature

Saha and De (2001) [8] reported that feed related problem are the most common constraints along with non-availability of quality seed, poor technical skill, marketing, social issues and credit problems those limits adoption of scientific carp culture technology.

Olaoye (2010) [6] reported that some of the problems faced by small scale fish producers in Nigeria were innovation adoption, inadequate research and extension, high cost of fish feed, post-harvest losses due to poor handling, processing, preservation and storage technologies, fish seed, lack of credit and insurance cover for fisheries enterprises.

Quagrainie *et al*. (2010) [10] found in their study about small-scale fish farmers in Kenya that the level of credit use in fish farming is very low even though the government of Kenya encourages aquaculture development by offering credit facilities through the government agricultural finance institution, Agriculture Finance Corporation.

Ashley-Dejo (2012) [1] mentioned that an effective extension service delivery is an essential factor for the accelerated development of agriculture in developing countries.

Materials and Methods

The Telangana state was chosen as the locale of the study. The existing 31 districts of the state are divided into three nearly homogeneous strata (each stratum with a given a number of districts-10-11) based on climate, rainfall, soil quality, resource spread, intensity and diversity of fisheries and aquaculture activities. For sampling, two districts from each strata were selected in consultation with the Department of Fisheries. Thus six districts were selected for study. Karimnagar, Kamareddy, Medak, Wanaparthy, Mahabubabad and Yadadri Bhuvanagiri districts were selected. Four mandals from each district and one village from each mandal were selected purposively based on availability of aquatic resources. Ten fishermen from each village were selected randomly thus constituting a total of two hundred and forty fishermen. Ex-post facto research design was adopted in this study. The data was collected with the help of pretested interview schedule. The statistical methods and tests such as frequency, percentage and Henry Garett ranking technique were used for the analysis of data.

Henry Garett ranking technique: It was used to assess the challenges faced by the fish farmers. In this technique, the respondents were asked to rank the given attribute according to the magnitude of the problem. The orders of merit given by the participants were converted into ranks by using the following formula.

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

Where,

R_{ij} = Rank given for the i^{th} item j^{th} individual

N_j = Number of items ranked by j^{th} individual

The percentage position of each rank obtained was converted into scores by referring to the table given by Henry Garett. Then for each factor, the scores of individual respondents were added together and divided by the total number of respondents for whom the scores were added. The mean scores for all the factors were calculated and ranked accordingly and inferences were drawn.

Results and Discussions

The analysis of table.1 revealed several resource constraints in the fisheries sector. The most significant constraint is the untimely and low-quality fish seed stocking by the government. This delay in providing adequate fish seeds can lead to suboptimal fish production, potentially due to limited resources for seed production and inadequate coordination between seed producers and government agencies.

Another notable constraint is the multiple and increasing demand for fresh water, driven by domestic, irrigation, industrial, and fisheries needs. This growing demand puts a strain on freshwater resources, leading to potential water scarcity for fish farms and impacting the overall sustainability and productivity of the fisheries sector.

Furthermore, the absence of dedicated land for drying and processing fish poses challenges for post-harvest activities. The lack of proper infrastructure and designated areas for drying and processing fish can result in reduced fish quality, diminishing market value, and limited opportunities for value addition in the fisheries sector.

The failure to follow natural conservation practices and maintain cleanliness in fishing activities was another constraint. This can have detrimental effects on aquatic ecosystems, including habitat degradation, reduced fish populations, and overall ecosystem health. Overfishing, destructive fishing methods, and improper waste management are contributing factors to this constraint.

Lastly, the presence of excessive aquatic vegetation near the creeks was identified as a constraint. This dense vegetation hinders fishing activities by obstructing access to fishing areas, impeding fish movement and visibility, and increasing the risk of entanglement or damage to fishing gear. Consequently, this constraint limits the efficiency and productivity of fishing operations in affected areas.

Table 1: The rank order of resource constraints as perceived by fishermen (n=240)

S. No	Resource constraints	Garrett mean score	Rank
1.	Untimely and low quality fish seed stocking by government	68.52	I
2.	Increasing demand for fresh water for domestic, irrigation, industry and fisheries	59.36	II
3.	No drying and processing land	45.29	III
4.	Natural conservation and cleanliness are not followed by the fishermen	39.53	IV
5.	Presence of aquatic vegetation near the creeks	32.24	V

The results from table.2 reveal that the state seed farms are plagued by several constraints. The primary issue was the ineffective management practices and low seed production. This could be attributed to various factors such as inadequate genetic selection, poor disease management, suboptimal nutrition, and inadequate farm management techniques. The absence of a well-defined package of practices for inland fishing is another major constraint, leading to inefficient operations and reduced productivity. Additionally, the lack of dedicated training facilities hampers the capacity building of fishery personnel, preventing them from acquiring essential knowledge and skills. Untimely availability of information about fish catch further complicates effective fisheries management, making it challenging to assess resources and plan market strategies. Inadequate allocation of resources and infrastructure limits the availability of necessary facilities,

modern equipment, and technical support required for efficient operations. Insufficient repair skills and technical know-how regarding gears and crafts also contribute to the constraints faced by the fisheries sector.

Table 2: The rank order of technological constraints as perceived by fishermen (n=240)

S. No	Technological constraints	Garrett mean score	Rank
1.	State seed farms are not effectively run and inadequate seed production	62.12	I
2.	Lack of package of practices for inland fishing	61.53	II
3.	Lack of training facilities	59.63	III
4.	No timely information about fish catch	55.48	IV
5.	Inadequate resources and infrastructural facilities	51.62	V
6.	Lack of modern equipments	46.21	VI
7.	Lack of repair skill and technical know-how about gears / crafts	41.32	VII

Upon examining table.3, it becomes evident that the foremost economic constraint is the erratic fluctuation in the price of fish. This constraint indicates that the fish market experiences unpredictable and inconsistent price variations, which can have significant implications for fishers and the fisheries sector as a whole.

The second-ranked economic constraint was high labor wages. This refers to the elevated costs associated with employing labor in the fisheries sector. Increased labor wages can impact the profitability and viability of fishing operations, particularly for small-scale fishers who may struggle to afford higher labor expenses.

The lack of credit facilities was another notable economic constraint. This constraint signifies the limited availability or access to credit for fishers, making it challenging for them to secure financial resources to invest in equipment, infrastructure, or other necessary inputs for their fishing activities. This constraint can hinder the growth and development of the fisheries sector.

The high input and maintenance cost for gears and crafts were highlighted as a constraint. This refers to the substantial expenses incurred in acquiring and maintaining fishing gears, boats, and other necessary equipment. The high costs associated with gear and craft maintenance can strain the financial resources of fishers and pose a significant economic challenge.

The high cost of fishing equipment was another economic constraint. This constraint suggests that the prices of fishing equipment, such as fishing nets, lines, and hooks, are relatively high. The increased costs of fishing equipment can create financial barriers for fishers, potentially limiting their ability to access modern and efficient gear.

Although not the top concern, insufficient subsidies and incentives, ranked sixth and were still a noteworthy constraint. Fishermen may believe that they were not receiving enough support and incentives from the government or other entities to enhance their fishing activities and economic prospects.

Table 3: The rank order of economic constraints as perceived by fishermen (n=240)

S. No	Economic constraints	Garrett mean score	Rank
1.	Erratic fluctuation in the price of fish	60.23	I
2.	High labor wages	49.16	II
3.	Lack of credit facilities	47.35	III
4.	High input and maintenance cost for gears and crafts	44.21	IV
5.	High cost of fishing equipment's	42.35	V
6.	Insufficient subsidies and incentives	36.56	VI

An analysis of table.4 reveals various policy constraints within the fisheries sector. The foremost constraint was the inefficient execution and implementation of government programs.

The second-ranked constraint was the improper distribution of government grants. This suggests that financial assistance provided by the government to support fishers or fisheries-related activities was not distributed equitably or transparently. The lack of proper distribution mechanisms can hinder the intended benefits and hinder the overall effectiveness of the grant programs.

Unfair practices followed by fishermen co-operative societies are noted as a policy constraint. This suggests that cooperative societies, which are intended to support and represent the interests of fishers, may engage in unfair or improper practices that negatively impact the welfare and livelihoods of their members. Such practices can hinder the cohesive functioning and collective benefit of fisher communities.

The inadequate government support for basic needs is another policy constraint. This implies that the government does not sufficiently address the fundamental needs of fishers, such as access to clean water, healthcare facilities, education, and social welfare programs. Insufficient support for basic needs can hinder the overall well-being and quality of life of fishers and their families.

Table 4: The rank order of policy constraints as perceived by fishermen (n=240)

S. No	Policy constraints	Garrett mean score	Rank
1.	Inefficient execution and implementation of government programmes	65.21	I
2.	Government grants are not properly distributed	58.51	II
3.	Unfair practices followed by the fishermen co-operative societies	52.65	III
4.	Inadequate Government support for basic needs	46.55	IV

The analysis of table.5 reveals several marketing constraints within the fisheries sector. The primary constraint identified is the dominance of middlemen in marketing. This indicates that intermediaries play a significant role in the marketing process,

which can lead to challenges such as reduced profit margins for fishers, lack of transparency, and limited bargaining power.

Lack of transport facilities for marketing was ranked second. This constraint suggests that inadequate transportation infrastructure and services hinder the efficient and timely transportation of fish from the source to the market. Insufficient transport facilities can result in delays, increased transportation costs, and potential spoilage of fish, negatively impacting market access and profitability.

Another significant constraint observed was the absence of a fair price for the catch. This implies that fishers may not receive fair compensation for their harvested fish, potentially due to exploitative pricing practices, lack of price transparency, or limited competition in the market. Unfair pricing can significantly affect the income and livelihoods of fishers.

The prevalence of the auction method of marketing is identified as a constraint. This indicates that fish are primarily sold through auction systems, which may not always provide optimal prices for fishers. The auction method can be influenced by various factors such as market demand, competition among buyers, and the quality of fish, which may result in unpredictable and potentially unfavorable prices for fishers. The absence of cold storage and value-added fish product processing facilities was another marketing constraint. This constraint implies that the lack of infrastructure for proper storage and processing limits the availability of value-added fish products, such as processed fish, fillets, or fish-based products. The absence of such facilities may restrict market opportunities, reduce product shelf life, and limit the overall profitability of the fisheries sector.

Insufficient infrastructure to hold the stock also identified as a constraint. This suggests that inadequate storage and holding facilities for fish stocks can lead to difficulties in managing and preserving the catch. Inefficient stock holding infrastructure can result in spoilage, loss of quality, and decreased market value of fish.

Improper hygiene and sanitation practices were noted as marketing constraints. Inadequate attention to hygiene and sanitation standards in handling and processing fish may compromise the quality and safety of the product. Poor hygiene practices may also lead to health concerns, consumer distrust, and limited market access.

Lastly, the constraint of less access to the market and its information suggests that fishers may face challenges in accessing markets and obtaining relevant market information. Limited market access and information may restrict the ability to reach potential buyers, analysis of market trends, and informed marketing decision making ability.

Table 5: The rank order of marketing constraints as perceived by fishermen (n=240)

S. No	Marketing constraints	Garrett mean score	Rank
1.	Dominance of middlemen in marketing	68.52	I
2.	Lack of transport facilities for marketing	61.35	II
3.	No fair price for the catch	59.65	III
4.	Auction method of marketing prevalent	51.32	IV
5.	No cold storage and value added fish products processing facilities	48.25	V
6.	Insufficient infrastructure to hold the stock	44.29	VI
7.	Improper hygiene and sanitation	39.54	VII
8.	Less access to market and its information	32.42	VIII

An examination of table.6 reveals various social constraints within the fisheries sector. The foremost constraint identified is the lack of cooperation among villagers. This constraint indicates that there may be a lack of collaboration and mutual support among community members involved in fishing activities. The absence of cooperation can hinder collective decision-making, resource sharing, and the overall development of the fishing community.

The second-ranking constraint was religious biasness and inferiority complex from other communities. This suggests that discriminatory attitudes and perceptions based on religious differences can create social tensions and hinder harmonious interactions among different communities involved in fishing. Such biases can adversely affect social cohesion and community relationships.

The constraint of off-season unemployment highlights the lack of employment opportunities for fishers during non-fishing seasons. This seasonal unemployment can result in economic hardships and instability for fishers and their families, particularly during periods when fishing activities are limited.

Conflicts in the fishing areas was identified as a social constraint. Disputes and conflicts among fishers, fishing communities, or among other stakeholders in fishing areas may disrupt the peaceful and productive functioning of the sector. Conflicts may arise due to competition over resources, territorial disputes, or other social and economic factors.

Political disturbances was also noted as a social constraint. This suggests that political unrest or instability in the fishing areas can negatively impact the livelihoods and well-being of fishers. Political disturbances can disrupt fishing activities, create uncertainties, and hinder the overall social and economic development of the fishing communities.

Theft practices followed by laborers after catch was highlighted as a social constraint. This constraint indicates that there may be instances of theft or pilferage of the catch by laborers or individuals involved in post-harvest activities. Such practices may result in economic losses to fishers and create a sense of insecurity within the fishing community.

Illiteracy among fishermen is identified as a social constraint. This suggests that a significant portion of the fishing community may lack basic literacy and numeracy skills, limiting their access to information, market opportunities, and other socio-economic resources. Illiteracy can hinder the overall empowerment and development of fishers.

Lastly, the prevalence of informal sector money lending activities was noted as a social constraint. This suggests that fishers may rely on informal money lending sources with potentially exploitative terms and conditions. The presence of informal money lending activities can lead to indebtedness, financial vulnerability, and limited access to formal financial services.

Table 6: The rank order of social constraints as perceived by fishermen (n=240)

S. No	Social constraints	Garrett mean score	Rank
1.	Lack of co-operation among villagers	68.19	I
2.	Religious biasness and inferiority complex from other communities	62.34	II
3.	Off season no employment	59.21	III
4.	Conflicts in the area of fishing	46.56	IV
5.	Political disturbances	42.19	V
6.	Theft practices followed by the labors after catch	41.25	VI
7.	Illiteracy among fishermen	39.49	VII
8.	Informal sector money lending activities are still prevalent	37.65	VIII

Suggestions given by Fishermen for Improving Inland Fisheries

An important discussion of the study was to seek the suggestions from fishermen in order to improve status of inland fisheries. The suggestions given by fishermen were presented in table.7.

The analysis of table.7 revealed that suggestions provided by the majority of fishermen. These suggestions encompass a range of key areas in fisheries management and development. Timely stocking of bigger size quality fingerlings was the top priority suggestion for resource constraint. This means that fish farmers were emphasizing the importance of timely and quality stocking of young fish for their aquaculture activities. Provisions for adequate water during summer months was the second most critical resource constraint. Fishermen were highlighting the necessity of water supply during hot and dry periods. Development and maintenance of infrastructure for fish processing and marketing was another significant concern, indicating a need for better facilities for handling and selling fish products. Monitoring and controlling wastewater and chemical inclusions is a concern but ranks lower in priority.

Table 7: Suggestions given by fishermen for improving inland fisheries (n=240)

S. No	Suggestions given by fishermen	Frequency	Percentage	Rank
	Suggestions for Resource constraints			
1.	Timely stocking of bigger size quality fingerlings	229	95.42	I
2.	The government should make provisions for adequate water for fisheries particularly during the summer months	211	87.92	II
3.	Development and maintenance of infrastructure for freezing, processing, landing and marketing of fish	203	84.58	III
4.	Need to monitor and control waste water and chemical inclusions in creeks and aquatic resources	86	35.83	IV
	Suggestions for Technological constraints			
5.	Demonstration of improved fish production technology and guidance should be made through extension activities	198	82.50	I
6.	Improve existing hatchery performance and capacity of government and private seed production units	183	76.25	II
7.	Provision of skill training and educational facilities for overall development of fishermen	181	75.42	III
8.	Updating the fishermen with modern crafts and gears	179	74.58	IV
9.	Supportive role of Government for repairs and maintenance of fishing equipments, crafts and gears	156	65.00	V
10.	Leverage mobile apps and platforms designed for fishermen that provide real-time information for fish catch based on weather conditions, water temperature, and fish migration patterns	141	58.75	VI
	Suggestions for Economic constraints			
11.	Mechanized equipment and automation technologies to reduce the reliance on manual labor	207	86.25	I
12.	Financial support through credit facilities at low interest	199	82.92	II
13.	Provide training for proper equipment handling and maintenance techniques	161	67.08	III
14.	Explore the possibility of leasing or renting fishing gear and crafts	146	60.83	IV
	Suggestions for Policy constraints			
15.	Establish monitoring systems to track the execution of government programs	219	91.25	I
16.	Implement transparent mechanisms for grant allocation	203	84.58	II
17.	Conduct audits of fishermen co-operative societies to ensure fairness	159	66.25	III
	Suggestions for Marketing constraints			
18.	Reduce dependence on middlemen by facilitating direct marketing channels for fishers	225	93.75	I
19.	Providing fair price for the catch	216	90.00	II
20.	Establish more mobile fish markets	209	87.08	III
21.	establishment of cold storage and value-added processing facilities	196	81.67	IV
22.	Provide informed about market trends and demand for different fish species	185	77.08	V
23.	Implement hygiene and sanitation standards to ensure safe and high-quality fish products	123	51.25	VI
	Suggestions for Social constraints			
24.	Encourage the active participation of fishermen in fisheries cooperative societies	218	90.83	I
25.	Organize workshops and training sessions to educate fishermen about the benefits of cooperation and the collective management of resources.	193	80.42	II
26.	Encourage fishermen to explore alternative sources of income	178	74.17	III
27.	Empower the fishing communities through education and skill development programs	165	68.75	IV
28.	Maintain detailed records of catches and inventory	154	64.17	V
29.	Establish adult literacy programs tailored to the needs of fishermen	151	62.92	VI

Demonstration of improved fish production technology and guidance was a top suggestion for tackling technological Constraints, underlining the need for practical guidance in adopting advanced fishing techniques. Improving hatchery performance was also highly regarded, emphasizing the importance of enhancing the capacity and effectiveness of fish seed production. Provision of skill training and educational facilities for fishermen was another vital suggestion, showing

the demand for continuous learning and skill development among fishermen. Updating fishermen with modern crafts and gears was important for enhancing the efficiency of fishing operations. Supportive role of the government for equipment repairs and maintenance and Leveraging mobile apps for real-time information were also recognized but rank slightly lower in priority.

Mechanized equipment and automation was the top ranked suggestion to deal with economic constraint, suggesting the importance of reducing manual labour reliance in fishing. Financial support through credit facilities at low interest was the second most important, indicating the need for affordable financing options. Training for proper equipment handling and maintenance was crucial for ensuring the longevity and efficiency of fishing equipment. Exploring leasing or renting fishing gear was also recognized but ranks lower in priority.

Establishing monitoring systems for government programs was the top recommendation for addressing policy constraints. This highlights the need for better oversight and evaluation of government initiatives. Implementing transparent grant allocation mechanisms was another significant suggestion, indicating the importance of fairness in resource allocation. Conducting audits of fishermen co-operative societies was also recognized as a way to ensure transparency and equity in cooperative organizations.

Reducing dependence on middlemen through direct marketing was the most pressing suggestion to overcome marketing constraint, suggesting the need for empowering fishers to directly access markets. Providing a fair price for the catch was the second most important concern, emphasizing the need for equitable compensation for fish products. Establishing more mobile fish was the third significant suggestion, pointing toward the importance of accessible and flexible marketing channels. Cold storage and value-added processing facilities and providing information about market trends were also relevant but rank slightly lower. Implementing hygiene and sanitation standards was also recognized but ranks lowest in the marketing category.

Promoting active participation of fishermen in fisheries cooperative societies was the top ranked suggestion to overcome social constraint, indicating the importance of cooperative societies in overall development of the sector. Organizing workshops and training sessions was the second most critical, emphasizing education about cooperation and resource management. Encouraging fishermen to explore alternative income sources was also recognized as vital for enhancing economic resilience. Empowering fishing communities through education and skill development and maintaining detailed records follow in importance. Establishing adult literacy programs was the lowest-ranked social constraint but is still significant.

The priority for action should be given to addressing the top-ranked constraints in each category, as these were the most critical concerns identified by fishermen. Solutions should be developed and implemented to mitigate these constraints effectively, taking into account their severity. Some constraints may require financial investments, while others can be addressed through improved planning and resource utilization. The overall objective was to enhance the performance and job satisfaction of fisheries department personnel and better support fishermen. Prioritizing and allocating resources efficiently based on constraint severity will maximize the department's impact on improving its performance.

Conclusion

In conclusion, the fisheries sector faces a myriad of challenges spanning resource constraints, economic hurdles, policy inefficiencies, marketing obstacles, and social complexities. Timely interventions are imperative to address issues like inadequate fish seed stocking, fluctuating fish prices, and the dominance of middlemen in marketing. The sustainability of the sector hinges on comprehensive solutions, including improved government programs, transparent grant allocation, and empowering fishing communities. Emphasizing cooperative efforts, skill development, and alternative income sources can enhance social cohesion and economic resilience. The insights from fishermen's suggestions underscore the urgency of prioritizing actions to mitigate the most critical constraints. A holistic and targeted approach, guided by the severity of each challenge, is essential to unlock the full potential of the fisheries sector, ensuring its long-term viability and contributing to the well-being of those dependent on it.

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