



Constraints Perceived by Beneficiaries in Adoption of Fisheries Development Programmes in Konkan Region, Maharashtra

V G Yewale*, K J Chaudhari, S M Wasave, S V Patil, B M Yadav, A U Pagarkar, B V Naik, S C Kamble and R H Rathod

College of Fisheries (Dr. B. S. Konkan Krishi Vidyapeeth), Ratnagiri, Maharashtra

ABSTRACT

Maharashtra state has vast fisheries resources at its disposal and considered as one of the vital maritime state in India. The current study was carried out with the objective of understanding the various constraints faced by the beneficiaries in the Konkan region, Maharashtra in adoption of schemes/programmes. The constraints faced by beneficiaries were categorized as social, financial, infrastructure, core fisheries and administrative constraints. The weighted average technique was used to analyze and rank various constraints faced by beneficiaries. Information was collected from 200 fishers from 4 coastal districts of Konkan region, Maharashtra. The study revealed that core fisheries constraints ranked first with weighted average score of 81.72 followed by financial constraints (80.05) as second, infrastructure (78.76) as third, administrative (75.54) as forth and social constraints (73.89) as least ranked constraints. Among the core fisheries related constraints availability of input (diesel) was highest. In financial constraints increasing price of diesel ranked first. Highest infrastructure related constraints were poor landing and berthing facilities whereas under the social related constraints conflicts in the area of fishing ranked first. The study suggested that, more efforts are needed to address the various constraints faced by beneficiaries in adoption of schemes/programmes.

Key Words: Adoption, Beneficiaries, Constraints, Development, Konkan region.

INTRODUCTION

Aquaculture and fisheries sector is a source of income and livelihood for many people all over the world. The fisheries sector is one of the key contributors in the national economy as well as foreign exchange earnings. The sector provides livelihood to about 28 million fishers and fish farmers at the primary level and twice the number along the value chain. The sector has contributed to the extent of 1.1% to national Gross Domestic Products and 6.72% of agriculture GDP with a growth of 10.34% (DoF, Ministry of Fisheries, Animal Husbandry & Dairying, India, 2022).

Fisheries extension plays a significant role in the development of the fisheries and aquaculture sector. Department of Fisheries (DoF) plays a major role in executing the extension programs at field levels. Maharashtra is one of the important maritime state with respect to fisheries considering

its vast fisheries resources at its disposal. Maharashtra has coastline of 720 km and the area suitable for marine fishing is 1.12 lakh sq. km. In addition to this, the area suitable for inland and brackish water fishing in the State is 4.19 lakh ha and 0.10 lakh ha respectively (DoF, Maharashtra, 2022). The total fish production of the state during 2021-22 was 5.89 lakh tonnes of which 4.32 lakh tonnes was from the marine sector and 1.57 lakh tonnes from the inland sector (DoF, Maharashtra, 2022). Several fisheries development programmes are implemented by the department of fisheries, Maharashtra. More numbers of stakeholders are seen to be involved as beneficiaries of schemes in fisheries sector with the implementation of schemes like Blue revolution and Pradhan Mantri Matsya Sampada Yojana (PMMSY). But often beneficiaries faced various constraints while adoption of various programmes/schemes. There are very few constraints based studies in other

Table 1. Constraints faced by beneficiaries in adoption of schemes/programmes.

Sr. No	Constraint	WA	Rank	NMS*	Mean Rank	Chi-Square Value	Decision
1	Core Fisheries	81.72	I	0.73	3.57	77.03	Reject H ₀
2	Financial	80.05	II	0.70	3.28		
3	Infrastructure	78.76	III	0.68	3.14		
4	Administrative	75.54	IV	0.63	2.61		
5	Social	73.89	V	0.62	2.40		

Table 2. Weighted average ranking and Friedman test results for social constraints.

Sr. No.	Constraint	WA	Rank	NMS*	Mean Rank	Chi-Square Value	Decision
1	Conflicts in the area of fishing	91.00	I	0.92	4.74	289.29	Reject H ₀
2	Off season no employment	85.50	II	0.78	4.23		
3	Training	73.33	III	0.60	3.48		
4	Non availability of proper information	70.83	IV	0.56	3.34		
5	Awareness about rights	61.83	V	0.43	2.65		
6	Less Coordination with Government departments	60.83	VI	0.41	2.56		
	Overall	73.89		0.62			

states and Union Territories like Kumar *et al* (2017) reported lack of awareness about scientific fish culture practices as a major extension constraint faced by fish farmers in Bihar. Angral *et al* (2017) reported lack of awareness regarding fisheries programs, lack of proper training/exposure visits, and no cooperation & coordination among the implementing agencies, like departments and financial institutions, as constraints perceived by fishers of Jammu & Kashmir. Patil and Sharma (2020) revealed that, lack of regular training program, less extension and technical support as major extension constraint by shrimp farmers of Konkan region of Maharashtra. Patil and Sharma (2021) in their study reported that, less training on scientific shrimp farming practices, inadequate staff strength and insufficient infrastructural facilities as major constraint's faced by fisheries extension personnel in Konkan region, Maharashtra. Yadav (2022) reported less coordination of fishers with fisheries organizations less mobility, low literacy of fishers,

gender issues and less fisheries information were major extension constraints faced by fishers in Rajasthan. Rathod *et al* (2024) reported that, financial and administrative are the major constraints perceived by beneficiaries in adoption of fisheries development programmes in Vidarbha region, Maharashtra. Patil and Sharma (2021) recorded the constraints faced among shrimp farmers of Palghar district in Maharashtra.

There are few studies in Maharashtra with reference to the constraints faced by the beneficiaries. The constraint studies particularly in Konkan region with respect to various stakeholders involved in fisheries are very meagre. Nevertheless, it seems from the studies that the beneficiaries/fishers/fish farmers faced number of constraints and these can differ as per administrative difficulties they faced in adoption/acceptance of fisheries development programmes, fisheries based technical problems, extension and training on recent technologies etc.

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In view of the above, the present investigation was an attempt to analyse the constraints perceived by beneficiaries in adoption of fisheries development programmes in Konkan region, Maharashtra.

MATERIALS AND METHODS

A total of 200 fishers who were beneficiaries of fisheries development programmes/schemes from 4 coastal districts of Konkan region *i.e.* Palghar- Thane, Raigad, Ratnagiri and Sindhudurg district were selected for the study. A thorough review of literature and discussions with an expert group were done in order to list out various constraints faced by beneficiaries/fishers in adoption of fisheries development programmes/schemes. A total of 32 constraints were then categorized under five heads viz. social, financial, infrastructure, core fisheries and administrative constraints.

Reliability of scale was tested with help of test retest method. The list of constraints was given to 10 beneficiaries other than respondents to provide the scores for their level of agreement towards each constraint. The same was repeated after 15 days. Based on the two sets of scores provided by beneficiaries, correlation coefficient was calculated. Correlation coefficient can take value between 0 and 1. So the closer to 1 means the more reliable of the scale. Test-retest reliability coefficient was 0.80 indicated that whole scale was reliable.

Interview schedule was used to collect information regarding constraints perceived by beneficiaries in adoption of fisheries development programmes in Konkan region, Maharashtra. A three point Likert scale was used to test the level of agreement of beneficiaries / fishers towards the respective constraints. This scale was 1 to 3, where, 3- strongly agree, 2 – agree and 1 – Not agree. The Weighted Average (WA) technique was used to rank various constraints faced by beneficiaries. Weighted Mean Score Value was calculated for each constraint. The weighted average was calculated as given below:

Weighted average = $\text{Sum } (X1.W1 + X2.W2 + X3.W3) / \text{sum } (W1+W2+W3)$

Where,

X 1, X 2, X 3, = Frequency of the respective constraints

W1, W2, W3, = Weighted values *i.e.* 1, 2, 3

The Friedman rank test, a non-parametric test (distribution-free) used to compare observations repeated on the same subjects. It was used to test if there was a significant difference between each constraint.

RESULTS AND DISCUSSION

It can be seen (Table 1) that core fisheries constraints ranked first with weighed average score of 81.72, while financial constraints ranked second (80.05). This was followed by infrastructure constraints (78.76), administrative constraints (75.54) and social constraints (73.89). Friedman rank test, a non-parametric test (distribution-free) used to test if there was a significant difference between each constraint. The results of friedman rank test revealed that there was a significant difference among different constraints at a 5% level of significance and the null hypothesis (H_0) is rejected ($P < 0.05$). This indicates the constraints affected the beneficiaries differently based on the difficulty they face while adopting the fisheries development programmes/schemes.

Social constraints

It was evident (Table 2) that among the social constraints, conflicts in the area of fishing (91.00) were ranked first by the beneficiaries of Konkan region followed by the off season no employment (85.50) and training (73.33) whereas the least ranked constraint was less coordination with government departments (60.83). The non-parametric Friedman test revealed that there was a significant difference among the constraints at a 5% level of significance and the null hypothesis (H_0) is rejected ($p < 0.05$) indicated that there was effect of social constraints on beneficiaries in adoption of fisheries development programmes/schemes. The beneficiaries revealed that there are disputes and conflicts among fishers, fishing communities, or among other stakeholders

Table 3. Weighted average ranking and Friedman test results for financial constraints.

Sr. No.	Constraint	WA	Rank	NMS*	Mean Rank	Chi-Square Value	Decision
1	Increasing price of diesel	89.33	I	0.84	4.85	132.33	Reject H_0
2	Insufficient subsidies and incentives	86.33	II	0.80	4.58		
3	High Interest rate	81.83	III	0.73	4.14		
4	Lack of institutional credit	81.00	IV	0.72	4.05		
5	High wage rate of crew	77.50	V	0.66	3.74		
6	High cost of fishing equipment's	73.00	VI	0.60	3.43		
7	High input and maintenance cost for gears and crafts	71.33	VII	0.57	3.21		
	Overall	80.05		0.70			

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. To overcome this issue government has to make policies to overcome the conflicts among the fishers. They also revealed that 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.

Studies on constraints faced by fishers/fish farmers have been reported by many workers. Patil khede *et al* (2018) while studying constraints faced by the fishermen of Konkan region reported that overexploitation of the middlemen, lack of cooperation among villagers, no schemes for welfare of fishermen also offseason no employment and conflicts in the area of fishing are the major social constraints. Angral *et al* (2017) reported lack of awareness regarding fisheries programs, lack of proper training/exposure visits, and no cooperation & coordination among the implementing agencies as constraints perceived

by fishers of Jammu & Kashmir. Uttej *et al* (2023) reported that off season unemployment and conflicts in the fishing areas are the major social constraints faced by Telangana fishermen. Patil (2020) revealed lack of regular training program, less extension and technical support as major extension constraint by shrimp farmers of Konkan region of Maharashtra. Rathod *et al* (2024) also reported less training, awareness about rights and getting proper information about schemes as extension constraints faced by the beneficiaries of Vidarbha region.

Infrastructure constraints

Among the infrastructure constraints, poor landing and berthing facilities (88.50) ranked first, no market availability (84.17) ranked second. In addition, source of fresh water (81.17) was ranked third followed by no market shed facilities (79.50) as fourth-ranked and poor transportation (71.67) as the least infrastructure constraint. Further, Friedman test results revealed that there was significant difference among the sub categories of financial constraints ($p < 0.05$). Therefore, the null hypothesis (H_0) was rejected. The mean ranks of the constraints were found to be in similar pattern of weighted average.

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Table 4. Weighted average ranking and Friedman test results for infrastructure constraints.

Sr. No.	Constraint	WA	Rank	NMS*	Mean Rank	Chi-Square Value	Decision
1	Poor landing and berthing facilities	88.50	I	0.83	4.87	106.99	Reject H_0
2	No market availability	84.17	II	0.76	4.41		
3	Source of fresh water	81.17	III	0.72	4.21		
4	No market shed	79.50	IV	0.69	4.06		
5	Lack of preservation and curing facilities	74.17	V	0.61	3.65		
6	Poor storage facilities	72.17	VI	0.58	3.42		
7	Poor Transportation	71.67	VII	0.58	3.39		
	Overall	78.76		0.68			

The beneficiaries reported that poor landing and berthing facilities was the foremost problem which lead to difficulty in loading and unloading fish catch and also delay to transport fish to market within time to avoid economic loss. They also reported unavailability of market facility and market sheds as a major problem. This lead to poor marketing chain and dependency on middleman or commission agents. If the market is developed near to the landing area, the fisher can sell their catch by oneself within time to avoid losses. Further, the beneficiaries reported that facility of source of water for fishing activities they paid more money for purchase of water.

Panday and Dewan (2006) also reported that the infrastructure constraints faced by the fish farmers of Uttar Pradesh, like ponds connectivity to road, cold storage, transportation facilities, markets. Rahaman *et al* (2013) revealed that the lack of storage facility, the unsuitable position of the market yard, lack of processing units are the major infrastructure constraints faced by the fishers of West Bengal. Patil (2020) also noted the lack of storage facility at pond site, lack of good roads, lack of good transportation facility, and non-availability of a cold storage facility were the major infrastructure constraints faced shrimp farmers of Maharashtra. Yadav (2022) reported lack of proper market availability in nearby areas, no regulated/organized market availability, lack of

ice storage facility, lack of transportation facilities and improper roads as infrastructure constraint in Rajasthan. Rathod *et al* (2024) recorded infrastructure constraints perceived by fisher of Vidarbha region and revealed that lack of warehousing facility, lack of market availability. The results of the present study are in support to the other studies reported by researchers in other states. The fisheries infrastructure facilities in the state can be developed with the support of Fisheries and Aquaculture Infrastructure Development Fund and Pradhan Mantri Matsya Sampada Yojana, like organized/modern fish markets and ice-storage facility to reduce post-harvest losses and strengthen fish markets.

Core fisheries constraints

The availability of input (diesel) ranked as the first constraint with a weighted average score of 90.17 followed by availability of ice with a weighted average score of 83.83, which ranked second, and availability of nets and gears with a weighted average score of 71.17, which ranked third. The beneficiaries reported that the availability of input *i.e.* diesel for fishing activity in time as you know that diesel is one of the most important for the fishing activity. Most of the times the diesel was not available at the time of fishing so that fisher get delay to go for fishing. The government also giving subsidies of VAT but

Table 5. Weighted average ranking and Friedman test results for core fisheries constraints.

Sr. No.	Constraint	WA	Rank	NMS*	Mean Rank	Chi-Square Value	Decision
1	Availability of input (diesel)	90.17	I	0.85	2.31	75.19	Reject H_0
2	Availability of ice	83.83	II	0.76	2.07		
3	Availability of nets and gears	71.17	III	0.57	1.62		
	Overall	81.72		0.73			

Table 6. Weighted average ranking and Friedman test results for administrative constraints.

Sr. No.	Constraint	WA	Rank	NMS*	Mean Rank	Chi-Square Value	Decision
1	More paperwork	95.17	I	0.93	7.10	493.03	Reject H_0
2	More frequent visits to DOF to get scheme sanctioned	92.33	II	0.89	6.78		
3	Undue delay in sanction of scheme	80.67	III	0.71	5.45		
4	Inadequate information and education about the development programme	80.33	IV	0.71	5.40		
5	Lack of cooperation between government officers and beneficiaries	77.17	V	0.66	5.07		
6	Improper coordination between financial institutions and local officials	68.67	VI	0.53	4.32		
7	Lack of proper supervision	67.00	VII	0.51	4.10		
8	Literature of scheme is not available in Marathi language	62.83	VIII	0.44	3.74		
9	Undue delay in selection of beneficiaries	55.67	IX	0.34	3.06		
	Overall	75.54		0.64			

the many times subsidies were not disbursed in time which led to losses.

The non-parametric Friedman test revealed that there was a significant difference among the constraints at a 5% level of significance and the null hypothesis (H_0) is rejected ($p < 0.05$)

indicated that there is effect of core fisheries constraints on beneficiaries in adoption of fisheries development programmes/schemes. Bhat and Sharma (2021) reported lack of fish storage facilities, no subsidy for crafts and gears, less availability of ice are the fishery related

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constraints perceived by the fisher of Jammu. Boda et al. (2024) revealed that the diesel prices, catch reduction, labour cost, supply of diesel are the main challenges faced by the fishermen of west Bengal.

Administrative constraints

The result revealed that among administrative more paperwork (95.17) was ranked first by beneficiaries followed by the more frequent visits to DOF to get scheme sanctioned (92.33) and undue delay in sanction of scheme (80.67) whereas the least ranked administrative constraint undue delay in selection of beneficiaries with weighted average score of 55.67. The non-parametric Friedman test revealed that there was a significant difference among the constraints at a 5% level of significance and the null hypothesis (H_0) is rejected ($p < 0.05$) indicated that there is effect of administrative constraints on beneficiaries in adoption of fisheries development programmes/schemes.

Beneficiaries reported that more paperwork is required for the submission of scheme applications. Some beneficiaries also mentioned using an online process to submit their applications, but such a provision or online system has not yet been developed by the Department of Fisheries. Beneficiaries also reported that they must visit the department office on a regular basis to receive application updates. Many beneficiaries have expressed concern about obtaining accurate information about schemes.

Panday and Dewan (2006) studied constraints in fish farming practices in Uttar Pradesh, India. The study reported that inadequate subsidy, lack of knowledge and extension support, non-existence/inactive cooperative societies are the major administrative constraints. Panday *et al* (2014) reported poor implementation of the fisheries development scheme, lack of policy support, inadequate extension contacts, lack of a need-based program for any organization as major administrative constraints faced by fish farmers of Manipur. Patilkhede *et al* (2018) reported that inefficient execution & implementation of government programs, government grants not being properly distributed, lack of package of fish

production, no training facilities and infrastructural facilities were the main constraints in sustainable livelihood activities of fisherman of Konkan region of Maharashtra. Yadav (2022) reported that administrative constraints had a very high severity such as delay in sanction of scheme by fisheries organizations, less supervision by officials and improper coordination between fisheries institutions are major administrative constraints faced by fishers of Rajasthan. Rathod *et al* (2024) reported that administrative constraints had a very high severity such as more paperwork, more frequent visits to DOF to get scheme sanctioned are the major administrative constraints faced by the fishers of Vidarbha.

CONCLUSION

The beneficiaries faced various constraints while adoption of fisheries development programmes/schemes. However, among these, core fisheries constraints ranked first while financial constraints ranked second. This was followed by infrastructure constraints, administrative constraints and social constraints. The non-parametric friedman test revealed that there was a significant difference among the constraints. Highest severity was found in the constraints such as conflicts in the area of fishing, offseason employment, increasing price of deiseal, insufficient subsidies, poor landing and berthing facility and more paperwork. The beneficiaries revealed that there are disputes and conflicts among fishers, fishing communities, or among other stakeholders in fishing areas also off-season unemployment highlights the lack of employment opportunities for fishers during non-fishing seasons. It was also reported that increasing cost on diesel which may increase the cost on fishing which can have the significant implications on the profit of fishers. Insufficient subsidies and incentives also one of the major financial constraints that fishers may believe that they are not receiving enough support and incentives from the government to enhance their fishing activities. They also reported that the availability of input i.e. diesel for fishing activity in time in this context, timely disbursement of subsidies from government department will be more helpful for beneficiaries. One of major

constraints reported by the beneficiaries was more paperwork required for the submission of scheme application. It is recommended that fisheries cooperatives should get training on new forms of marketing like online and fast home delivery methods to compete with modern trends. In order to achieve the relevant and cost effective solutions to all the constraints of the fishers, a multi-organizational approach is highly required which will help in the implementation of new policies and strategies considering the opportunities and constraints prevailing to fishers.

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