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Constraint analysis of officials of department of fisheries of Vidarbha region of Maharashtra

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Abstract

Maharashtra is one of the important state with respect to fisheries considering its vast fisheries resources. Several fisheries development programmes are implemented in the state for development of inland fisheries. The DoF officials are striving hard for development of fisheries in the state. The DoF officials face constraints and these can differ as per water body and the type of fisheries being practiced there. Present study was carried out with the objective of assessing the constraints faced by the DoF officials in the Vidarbha region of Maharashtra. A total of 48 constraints were categorized under seven heads - 'Extension and Training' (08), 'Administrative & Management' (11), 'Technical' (06), 'Input Supply' (06), 'Financial' (06), 'Communication and Human Relations' (07) and 'Social' (04). Information was collected from 32 DoF officials from 11 districts of Vidarbha region of Maharashtra. The responses were statistically analyzed using weighted average technique and Friedman test. Maximum severity score was 12.8 and minimum was 0. The results revealed that, administrative and management constraints were severe with score 8.63/10. All other constraints had medium score.

Keywords: Constraints, officials, DoF, fisheries

Introduction

The role of Department of Fisheries (DoF) officials is very important in formulating and implementing different schemes and policies suitable for the development of fisheries in respective states in India. The success of any agricultural or fisheries extension services largely depends on the extension skills of these technical work force (Kashem *et al.*, 2001) [6]. India's agri-extension services has been evolving but the real question lies in building capacities of the personnel involved in extension so that technologies are transferred to the bottom of the pyramid equitably and efficiently. India's agriculture extension system is well developed and now number of sub disciplines has emerged. Among these, fisheries extension is one which is promising. Fisheries extension is important and caters to marine capture/culture and inland culture/capture etc. Each state in India is blessed with diverse water resources therefore, fisheries extension plays a very important role in the development of the sector. States play a major role in executing the extension programs at field levels through their respective Department of Fisheries (DoF). Maharashtra is one of the important state with respect to fisheries considering its vast fisheries resources. The inland fisheries resources of Maharashtra include 16,000 km rivers and canals, 2, 99, 000 ha reservoirs & 72,000 ha tanks ponds (DoF, 2022). During 2021-22, the total fish production of the State 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, 2022). Several fisheries development programmes are implemented in the state. The DoF officials are striving hard for development of fisheries in the state. But often they face constraints. Constraint based studies have been done in other states and Union Territories like Angral *et al.* (2017) [12] in their study in Jammu & Kashmir region have reported that fisheries extension service provider faces a number of constraints like lack of cooperation, illiteracy, lack of institutional credit, low level of fish farmer's participation, lack of adequate co-operation and coordination from the line departments and lack of seriousness which become a hurdle in development. Pandey (2009) [12] reported the constraints faced by officials of DoF, Tripura in the transfer of improved aquaculture technologies. Constraints reported were lack of communication and transportation facilities, lack of infrastructural facilities, delay in communication of messages at the right time which act as barrier to successful implementation of the programmes, In addition lack of mobility, non-aquaculture extension duties, a high target set by the organization, the bureaucratic pattern of district administration, top-level officials failing to provide adequate leadership to staff, poor co-ordination with various development agencies, lack of infrastructural facilities, inadequate budget provided by the Government for technology transfer programmes, inadequate availability of

law material/ inputs, vast jurisdiction of coordinators were also some constraints.

Pathak *et al.* (2014) ^[14] studied problems perceived by Fisheries Extension Officers (FEOs) of Assam and West Bengal (W.B.), which were classified under heads administration, finance, infrastructure, psycho-social, extension, and psychological. Study reported that finance related problems ranked first followed by administrative and infrastructure related constraints. Finance related problems included issues like late salaries, irregular payment of travel and dearness allowances, the disparity in pay scale, etc. For, FEOs of W.B. administration related problems like late promotion and transfer problems were high.

Katre *et al.* (2024) ^[8] have assessed the problems faced in fisheries governance in reservoirs of M.P and Katre *et al.* (2023) ^[7] also studied the role of DoF in M.P. regarding fisher women participation. Agnes and Sharma (2023) ^[1] discussed the issues in extension systems of shrimp farmers of Tamil Nadu. Prusty and Sharma (2023) ^[19] assessed the occupational issues of inland fishers and role of DoF in Odisha and Sharma *et al.* (2023) ^[20] discussed the issues faced by Indian shrimp farm workers. Patil and Sharma (2021) ^[18] have also studied the information sources used by fisheries officials of Maharashtra. Thapa *et al.* (2023) ^[22] studied the constraints faced by Jhora fish farmers in the Darjeeling Himalayas. Yadav and Sharma (2022) ^[23] performed the gender Analysis of ornamental fish production units in Maharashtra and role of DoF. Pal *et al.* (2022) ^[11] reported hazard maps as aid for critical area-specific information during the disaster for quick evacuation and to prepare management strategy and also be used to evolve a new facility and for insurance purposes. Ghosh *et al.* (2022) ^[4] analysed the livelihood developmental interventions in Indian Sundarbans and role of DoF in West Bengal; Yadav *et al.* (2022) ^[23] and Yadav *et al.* (2022) ^[23]

studied the role of extension service providers in Rajasthan and constraints faced by them. Patil and Sharma (2021) ^[18] prioritized the training needs of extension personnel in Ratagiri and studied the constraints faced by them. Patil and Sharma (2021) ^[18] recorded the constraints faced among shrimp farmers of Palghar district in Maharashtra.

There are a few studies done with reference to the constraints faced by the DoF officials in context of Maharashtra, particularly in Vidarbha region constraints study of DoF officials are very meagre. Nevertheless, it seems from the few studies that the DoF officials face constraints and these can differ as per water body and the type of fisheries being practiced there. Thus, present study was done with the objective of assessing the constraints faced by the DoF officials in the Vidarbha region of Maharashtra.

Materials and Methods

In order to enlist the constraints faced by officials of State Fisheries Department, Government of Maharashtra, a thorough review of literature and 04 discussions with an expert group were done and all constraints faced by officials were listed. The expert group for constraints faced officials comprised of 03 academicians, 03 extension officers and 03 government officials.

Further discussions were held in field with 15 officials (other than expert group) where they were requested to suggest if they faced any other constraints in addition to those listed. The constraints suggested by these officials were also incorporated. A total of 48 constraints were then categorized under seven heads - 'Extension and Training' (08), 'Administrative & Management' (11), 'Technical' (06), 'Input Supply' (06), 'Financial' (06), 'Communication and Human Relations' (07) and 'Social' (04).

1. Extension & Training constraints	: Lack of training related to job, Lack of problems oriented researches, Lack of transport facilities for field visits, Insufficient duration of training programme, Non-supply of training literature, Lack of practical skill during training, Untimely schedule of field visits, Insufficient funds for training
2. Administrative & Management related constraints	: Target oriented approach, Inadequate allowances, Non-cooperation from linked departments, Absence of contact farmers on the day of visit, Interference of local leaders, Pressure from higher officers, Delay in sanction of programme/activities, Large number of vacant posts, Diversified duties and assignments, No separate facility of office, Burden of additional duties
3. Technical Constraints	: Non-availability of latest fisheries literature, Lack of information on improved technologies within time, Non availability of electronic equipments, Lack of technical skills to operate audio visual aids, Lack of internet connection in office, Lack of computer literacy
4. Input Supply Constraints	: Untimely input supply, Inadequate input supply, Higher cost of seeds, fertilizers & pesticides, Difficulty in the distribution of inputs to fishers, Increased demand for inputs, Risk in input supply
5. Financial Constraints	: Lack of sufficient pay, Untimely salary, Salary is less as compared to nature of work, Inadequate grants for programme/activities, Untimely grants for programme/ activities, No compensation or incentives for additional work
6. Communication and Human Relation Constraints	: Lack of communication skills, Inadequate audio and visual aids, Inadequate information about innovations, Lack of communication with local leaders, Unaware about ICT tools, Reluctance from fishers in communication, Lack of time to establish communication with farmers
7. Social Constraints	: Lack of time to participate in social programmes, Lack of time to participate in domestic/religious programmes, Non availability of residential quarters, Children's education is suffered due to stay in remote places / frequent shifting due to transfers

Information regarding constraints faced by officials of DoF was collected by using an interview schedule. A five point Likert scale (Likert, 1932) was used to test the level of severity of official towards the respective constraints. This scale was 0 to 4, where, 0 – Not Severe, 1 – Less Severe, 2- Moderately Severe, 3 – High Severe and 4 – Very high Severe.

Officials for present study were selected from each district of both the Amravati and Nagpur divisions. Therefore, a total of 32 officials from 11 districts of Vidarbha region (Amravati Division – 05 Districts – 15 officials and Nagpur Division – 06 Districts – 17 Officials). The total number of technical staff under Department of Fisheries in Vidarbha region (11 Districts) is 53. Interview schedule was used for

information collection regarding the constraints faced by officials of DoF.

Statistical analysis

Weighted average technique

The weighted average technique was applied to analyze and rank various constraints faced by shrimp farmers and extension personnel (Yadav *et al.*, 2017; Patil and Sharma, 2020) [24, 17]. The weighted average for each constraint was calculated by multiplying frequency of each constraint with respective weight/score. The weighted values taken for calculating weighted average were: 0 - strongly disagree, 1 - disagree, 2- moderately agree, 3 - agree and 4 - strongly agree.

Region	Sample size (n)	Minimum weight	Maximum weight	Sum of weights	Minimum Score	Maximum Score
A	B	C	D	E	(B x C)/E	(B x D)/E
Amravati	15	0	4	10	0	6
Nagpur	17	0	4	10	0	6.8
Overall (N)	32	0	4	10	0	12.8

Accordingly, the constraints faced by beneficiaries were ranked based on the scores obtained. The constraints with score between 0 to 4 were considered as less severe, score between 4.1 to 8 as medium severe and score above 8 as most severe constraints.

Friedman rank test for differences among constraints

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. Hypothesis used is as follows;

H_0 = There is no significant difference between each constraint faced by DoF officials

H_1 = There is a significant difference between each constraint faced by DoF officials

$$F_R = \frac{12}{rc(c+1)} \sum_{j=1}^c R_j^2 - 3r(c+1)$$

The formula for weighted average is as follows:

$$\text{Weighted average} = \frac{\text{Sum } (X_1.W_1 + X_2.W_2 + X_3.W_3 + X_4.W_4 + X_5.W_5)}{\text{Sum } (W_1+W_2+W_3+W_4+W_5)}$$

Where,

X_1, X_2, X_3, X_4, X_5 = Frequency of the respective constraints

W_1, W_2, W_3, W_4, W_5 = Weighted values i.e. 0,1, 2, 3 and 4

Maximum and minimum weighted score for each region for DOF officials

Where,

R_2j = square of the total of the ranks for group j ($j = 1, 2, c$)

r = number of blocks

c = number of groups

Based on the p-value of corresponding parameters, the decision has been taken on those parameters which are having p-values less than 0.05 and this led to the decision toward rejection of H_0 , suggesting a statistically significant difference and for p-values greater than 0.05 the decision was to accept H_0 .

Results and Discussions

Constraints faced by officials of DoF, Maharashtra in Vidarbha region were recorded. A total of 32 officials provided their responses under seven heads of constraints. The weighted average, severity and ranking of constraints is presented in Table 1.

Table 1: Constraint faced by Department of Fisheries Officials

S. No.	Constraints	Weighted Average (Max Score = 12.8)	Severity	Rank
1.	Extension and Training Constraints	6.40	Medium	V
2.	Administrative Management Constraints	8.63	High	I
3.	Technical Constraints	4.37	Medium	VII
4.	Input Constraints	7.17	Medium	III
5.	Financial Constraints	7.47	Medium	II
6.	Communication & Human Relations Constraints	5.51	Medium	VI
7.	Social Constraints	6.88	Medium	IV
		6.63	Medium	

The constraints faced by officials of DoF, Maharashtra in Vidarbha region were ranked based on weighted average and categorized as low (0 – 4), medium (4.1 – 8) and high (> 8). It can be concluded from table 4.8 that overall severity of constraints among the DoF officials was found to be medium. However, among these, administrative and management constraints (8.63) was high in severity among

the DoF officials, whereas, all other constraints were reported to be medium severe with lowest weighted average in technical constraints.

Further, non-parametric Friedman test was applied to test the significance among the constraints faced by officials of DoF, Maharashtra in Vidarbha region. The results of Friedman test is depicted in Table 2.

Table 2: Friedman test results for constraints faced by officials of DoF

S. No	Constraints	N	NMS*	Mean Rank	Chi-Square Value	Decision
1	Extension and Training Constraints	32	0.50	3.64	84.964	Reject H ₀
2	Administrative and Management Constraints	32	0.67	6.11		
3	Technical Constraints	32	0.34	1.73		
4	Input Supply Constraints	32	0.56	4.58		
5	Financial Constraints	32	0.58	4.66		
6	Communication & Human Relations Constraints	32	0.43	2.77		
8	Social Constraints	32	0.54	4.52		

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 (H₀) is rejected ($p < 0.05$). This indicates the constraints affects the officials of DoF differently based on the nature of work they perform. Further, considering the mean ranks of constraints, it can be concluded that, administrative and management constraints (7.83) is most severe, followed by financial constraints (4.66) and input supply constraints (4.58), whereas, least severe constraint was technical constraint (1.73).

The results of individual constraints are presented as follows:

Extension and training constraints

The extension and training constraints faced by the DoF officials included eight sub categories such as lack of training related to job, lack of problems oriented researches, lack of transport facilities for field visits, insufficient duration of training programme, non-supply of training literature, lack of practical skill during training, lack of practical skill during training, untimely schedule of field visits and insufficient funds for training. Weighted average of each sub category under extension and training constraints were calculated and ranked based on severity and non-parametric Friedman test for significant difference among these constraints was computed (Table 3).

Table 3: Weighted average ranking and Friedman test results for extension and training constraints

S. No.	Constraints	WA	Severity	Rank	NMS*	Mean Rank	Chi-Square Value	Decision
1.	Lack of training related to job	6.8	Medium	IV	0.53	4.66	99.633	Reject H ₀
2.	Lack of problems oriented researches	9.6	High	III	0.75	5.95		
3.	Lack of transport facilities for field visits	10.0	High	II	0.78	6.14		
4.	Insufficient duration of training programme	3.5	Low	VI	0.27	3.14		
5.	Non-supply of training literature	3.5	Low	VI	0.27	3.14		
6.	Lack of practical skill during training	2.4	Low	VIII	0.19	2.70		
7.	Untimely schedule of field visits	4.3	Medium	V	0.34	3.64		
8.	Insufficient funds for training	11.1	High	I	0.87	6.63		
	Overall	6.4	Medium		0.50			

It is clear from table 3 that overall the extension and training constraints were of medium severity. However, among the extension and training constraints, insufficient funds for training (11.1), lack of transport facilities for field visits (10.0) and lack of problems oriented researches (9.6) were high on severity, Lack of training related to job (6.8) was medium severe, whereas, insufficient duration of training programme (3.5) and non-supply of training literature (3.5) were less severe based on weighted average. 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 (H₀) is rejected ($p < 0.05$) indicated that there is effect of extension and training constraints on DoF officials as constraints are distributed based on mean rank that shows disparity in severity of constraints.

The officials of DoF revealed that there is very meager or no provision of funds for trainings in the annual budget. The trainings, demonstrations or field visits are conducted from limited funds, this lead to problems in organization and management of training. Similarly, there is no office vehicle even if there is provision of office vehicle for each district office is there. This cause difficulty in conducting field visits. The officials also reported that, because of introduction of new schemes on advanced culture practices like biofolc, RAS etc. under Pradhan Mantri Matsya

Sampada Yojana, people ask about the technology for adoption. There are many field oriented problems such as symptoms or cause of disease, floc crash, specificfication of RAS etc. The officials find it difficult to address such problem.

Studies on constraints faced by extension personnel have been reported by many workers. Yadav (2022) ^[23] reported that the extension service providers of Rajasthan had undergone few trainings and less emphasis was given on practical skills during training programmes. The officials stated that the training programmes were more theoretical, lacking practical skills regarding fisheries/aquaculture and less training literature. The study further mentioned that the training program's duration was reported to be short. Patil and Sharma (2020) ^[17] revealed that less training on scientific farming practices as well as less skill for conducting demonstrations was the extension constraint ranked at first by extension personnel followed by less availability of training material, while the least ranked extension constraint was few trainings on communication skills in Konkan region of Maharashtra.

Administrative and Management constraints

The Administrative and Management constraints faced by the DoF officials included eleven sub categories such as target oriented approach, inadequate allowances, non-

cooperation from linked departments, absence of contact farmers on the day of visit, interference of local leaders, pressure from higher officers, delay in sanction of programme/activities, large number of vacant posts, diversified duties and assignments, no separate facility of

office and burden of additional duties. Weighted average of each sub category under extension and training constraints were calculated and ranked based on severity and non-parametric Friedman test for significant difference among these constraints was computed (Table 4).

Table 4: Weighted average ranking and Friedman test results for administrative and management constraints

S. No.	Constraints	WA	Severity	Rank	NMS*	Mean Rank	Chi-Square Value	Decision
1.	Diversified duties and assignments	10.0	High	III	0.78	7.08	71.667	Reject H ₀
2.	Burden of additional duties	10.8	High	I	0.84	7.70		
3.	Large number of vacant posts	6.9	Medium	IX	0.54	4.66		
4.	Absence of contact farmers on the day of visit	3.6	Low	X	0.28	2.73		
5.	Pressure from higher officers	9.7	High	IV	0.76	6.70		
6.	Target oriented approach	9.2	High	VII	0.72	6.22		
7.	Interference of local leaders	8.3	High	VIII	0.65	5.77		
8.	Delay in sanction of programme/activities	9.6	High	V	0.75	6.56		
9.	Non-cooperation from linked departments	10.4	High	II	0.81	7.48		
10.	Inadequate allowances	6.9	Medium	IX	0.54	4.64		
11.	No separate facility of office	9.5	High	VI	0.74	6.45		
	Overall	8.63	High		0.67			

Table 4 shows that the overall the administrative and management constraints were of high severity. Out of 11 sub categories, 9 were highly severe. Among these high severe constraints, burden of additional duties (10.8) was felt to be highest in severity, followed by non-cooperation from linked departments (10.4) and Diversified duties and assignments (10.0). 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 (H₀) is rejected ($p < 0.05$).

The officials reported that engagement in various additional duties hampers their job profile. It was evident that, the district administration engages the government servants of various departments in different activities like elections, public welfare programmes, awareness programmes emphasized be central and state government from time to time. This ultimately hinders the actual activities of the fisheries department. In addition to this, delay in sanctioning of programmes/activities was also most severe problem faced by the officials, this was mostly due to lengthy administrative processes. It was also reported noncooperation from other departments such as irrigation department, Water supply department, and Gram panchayats.

The findings of the present study are similar to other studies on constraints faced by extension personnel. Yadav (2022) [23] while studying constraints faced by extension service providers in Rajasthan also found that burden of additional duty and non-cooperation from other linked departments were top administrative and management constraints. Similarly, Patil *et al.* (2017) [15] also reported that extension personnel of the fisheries department in Maharashtra faced administrative constraints like diversified duties and assignments, no compensation or incentives for additional

work. Jadoun *et al.* (2017) [5] reported constraints of animal husbandry officials in Haryana, wherein, administrative constraints like heavy workload during peak season followed by the inadequacy of staff were highly severe. Study conducted by Angral *et al.* (2017) [2] in Jammu and Kashmir reported that DoF officials were not getting full co-operation from the respondents, therefore there was participations during trainings and technology transfer. Patel *et al.* (2016) [13] reported inadequate staff strength in agriculture department leading to addition work load as foremost administrative constraint faced by extension personnel of Karnataka. Pathak *et al.* (2014) [14] reported constraints of fisheries extension officers in Assam and W.B. and found administrative constraints like late promotion and transfer problems, and additional duties like census work and election duties as top constraints. Pandey (2009) [12] also reported that the DoF officials in Tripura also faced constraints like high targets set by the organization, bureaucratic pattern of district administration and poor coordination with various development agencies.

Technical constraints

The technical constraints faced by the DoF officials were also recorded and classified in six sub categories *viz.* non-availability of latest fisheries literature, lack of information on improved technologies within time, non-availability of electronic equipments, lack of technical skills to operate audio visual aids, lack of internet connection in office and lack of computer literacy.

Weighted average of each sub category under technical constraints were calculated and ranked based on severity and non-parametric Friedman test for significant difference among these constraints was computed (Table 5).

Table 5: Weighted average ranking and Friedman test results for technical constraints

S. No.	Constraints	WA	Severity	Rank	NMS*	Mean Rank	Chi-Square Value	Decision
1.	Non-availability of latest fisheries literature	3.7	Low	III	0.29	3.33	83.156	Reject H ₀
2.	Lack of information on improved technologies within time	10.3	High	I	0.80	5.39		
3.	Non availability of electronic equipments	1.0	Low	VI	0.08	2.31		
4.	Lack of technical skills to operate audio visual aids	1.8	Low	V	0.14	2.59		
5.	Lack of internet connection in office	6.8	Medium	II	0.53	4.39		
6.	Lack of computer literacy	2.6	Low	IV	0.20	2.98		
	Overall	4.37	Medium		0.34			

Table 5 shows that overall the technical constraints were of medium severity. However, among them, lack of information on improved technologies within time (10.3) was high in severity, whereas, lack of internet connection in office was medium severe (6.8) based on weighted average. 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 (H₀) is rejected ($p < 0.05$).

The results of present study are supported by other studies in India. Yadav (2022) [23] reported less availability of the latest fisheries literature as most severe among the extension service providers in Rajasthan. The study also revealed that DoF and RTADCF do not have a fisheries laboratory and sufficient fisheries field equipment like equipment for water quality and soil quality tests. Patilkhede *et al.* (2018) [16] noted technical constraints like no training facilities, no timely information about the fish catch, inadequate

resources and infrastructural facilities, and lack of modern equipment in the coastal Konkan region of Maharashtra. Researchers like Majhi (2001) [9]; Misha *et al.* (2016) [10] and Pathak *et al.* (2014) [14] have also reported that poor infrastructure, non-availability of training literature, and non-availability of equipment's as major constraints faced by fisheries extension personnel.

Input supply constraints

The input supply constraints faced by the DoF officials included six sub categories such as untimely input supply, inadequate input supply, higher cost of seeds, fertilizers & pesticides, difficulty in the distribution of inputs to fishers, increased demand for inputs, risk in input supply. Weighted average of each sub category under extension and training constraints were calculated and ranked based on severity and non-parametric Friedman test for significant difference among these constraints was computed (Table 6).

Table 6: Weighted average ranking and Friedman test results for input supply constraints

S. No.	Constraints	WA	Severity	Rank	NMS*	Mean Rank	Chi-Square Value	Decision
1.	Untimely input supply	8.60	High	II	0.67	4.09	34.407	Reject H ₀
2.	Inadequate input supply	7.30	Medium	III	0.57	3.42		
3.	Risk in input supply	4.30	Medium	VI	0.34	2.52		
4.	Difficulty in the distribution of inputs to fishers	6.00	Medium	V	0.47	3.02		
5.	Increased demand for inputs	10.40	High	I	0.81	4.72		
6.	Higher cost of seeds, fertilizers & pesticides	6.40	Medium	IV	0.50	3.23		
	Overall	7.17	Medium		0.56			

It can be observed from table 6 that the overall the input supply constraints were medium severe. Among these constraints, increased demand for inputs (10.40) and untimely input supply (8.60) were found high in severity, whereas, remaining constraints were of medium severity. The DoF officials have reported that there is high demand of inputs such as seed, feed, medicines, probiotics, mineral mixtures etc. in the region. This was because of increase in culture practices especially after introduction of FFDA and Blue revolution schemes. The fish farmers are aware regarding quality seed, feeding, use of medicine etc. this ultimately resulted in increased demand of inputs. 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 (H₀) is rejected ($p < 0.05$).

Similar constraints were studied by many researchers in India and have reported matching results with present study. Misha *et al.* (2016) [10] also reported increased demand of inputs and untimely supply of inputs are severe constraints in transfer of technology in Maharashtra. Patil *et al.* (2017) [15] who reported that input supply as the most severe

constraint perceived by the extension personnel of the agriculture department of Maharashtra. Sharma *et al.* (2018) [21] reported irregular supply of seeds, lack of quality feed, high cost of supplementary feed, and irregular/inadequate supply of inputs in Rajasthan. Yadav (2022) [23] reported high cost of seeds, fertilizers and pesticides as most important constraint followed by difficulty in the distribution of inputs to fishers and inadequate input supply in Rajasthan.

Financial constraints

The financial constraints faced by the DoF officials included six sub categories *viz.* no compensation or incentives for additional work, untimely salary, salary is less as compared to nature of work, inadequate grants for programme /activities, untimely grants for programme/ activities and lack of sufficient pay. Weighted average of each sub category under extension and training constraints were calculated and ranked based on severity and non-parametric Friedman test for significant difference among these constraints was computed (Table 7).

Table 7: Weighted average ranking and Friedman test results for financial constraints

S. No.	Constraints	WA	Severity	Rank	NMS*	Mean Rank	Chi-Square Value	Decision
1.	No compensation or incentives for additional work	10.70	High	I	0.84	4.88	70.000	Reject H ₀
2.	Untimely salary	0.80	Low	VI	0.06	1.34		
3.	Salary is less as compared to nature of work	9.10	High	II	0.71	3.95		
4.	Inadequate grants for programme/activities	8.70	High	III	0.68	3.80		
5.	Untimely grants for programme/ activities	7.80	Medium	IV	0.61	3.48		
6.	Lack of sufficient pay	7.70	Medium	V	0.60	3.55		
	Overall	7.47	Medium		0.58			

The results presented in table 7 indicate that the overall the financial constraints were medium severe. No compensation or incentives for additional work (10.70), Salary is less as compared to nature of work (9.1) and Inadequate grants for programme/activities (8.70) were found high in severity, whereas, remaining constraints were of medium severity except untimely salary (0.81) scored lowest in severity indicating salary is not a matter of concern as it is given timely to the officials. 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 (H₀) is rejected ($p < 0.05$).

The result of present study meets the results reported by other researchers in India. Pathak *et al.* (2014) ^[14] reported finance-related problems faced by FEOs of Assam and W.B. including issues like late salaries, irregular payment of travel allowance/dearness allowance disparity in pay scales. Patel *et al.* (2016) ^[13], while studying constraints of extension personnel in Karnataka reported insufficient salary as compared to work load as the second major financial constraint. Similarly, Mishra *et al.* (2016) ^[10] also reported the similar financial constraint. Patil *et al.* (2017) ^[15] reported extension personnel of the agriculture department in Maharashtra faced financial constraints like no compensation or incentives for additional work. Patil and Sharma (2020) ^[17] studied the constraints faced by extension

personnel in coastal districts of Maharashtra. The study reported that insufficient salary as compared to work load, inadequate TA & DA were the most severe financial constraint faced by extension personnel of all the coastal districts of Maharashtra. Yadav (2022) ^[23] revealed inadequate and untimely grants for programmes/activities as a major constraint in Rajasthan. It was also reported that no compensation or incentives for additional work was provided in Private organisations and NGOs. These officials stated that fewer grants for programmes/activities were there and the grants were untimely. Similar results have been reported by Jadoun *et al.* (2017) ^[5] in Haryana.

Communication and human relations constraints

The DoF officials face various communication and human relations constraints. These include inadequate audio and visual aids, lack of time to establish communication with farmers, inadequate information about innovations, lack of communication skills, lack of communication with local leaders, unaware about ICT tools and reluctance from fishers in communication.

Weighted average of each sub category under extension and training constraints were calculated and ranked based on severity and non-parametric Friedman test for significant difference among these constraints was computed (Table 8).

Table 8: Weighted average ranking and Friedman test results for communication and human relation constraints

S. No.	Constraints	WA	Severity	Rank	NMS*	Mean Rank	Chi-Square Value	Decision
1.	Inadequate audio and visual aids	8.60	High	III	0.67	5.25	119.790	Reject H ₀
2.	Lack of time to establish communication with farmers	8.90	High	II	0.70	5.23		
3.	Inadequate information about innovations	10.00	High	I	0.78	5.67		
4.	Lack of communication skills	8.40	High	IV	0.66	4.97		
5.	Lack of communication with local leaders	1.10	Low	V	0.09	2.33		
6.	Unaware about ICT tools	1.00	Low	VI	0.08	2.38		
7.	Reluctance from fishers in communication	0.60	Low	VII	0.05	2.17		
	Overall	5.51	Medium		0.43			

Table 8 shows that the overall the communication and human relations constraints were of medium severity with weighted average of 5.51. Out of 7 sub categories, 4 were highly severe. Among these high severe constraints, Inadequate information about innovations (10.00) was felt to be highest in severity, followed by Lack of time to establish communication with farmers (8.90), Inadequate audio and visual aids (8.60) and Lack of communication skills (8.40). The officials reported that, due to introduction of new schemes on diversified culture practices like Biofloc, RAS etc., it is difficult to communicate technically with the beneficiaries because of lack of information on such innovation. It was also revealed from the officials that engagement in several additional duties and burden of

administrative work leads to lack of time in communication with farmers.

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 (H₀) is rejected ($p < 0.05$).

The findings of the present study are similar to other studies on constraints faced by extension personnel. Yadav (2022) ^[23] while studying constraints faced by extension service providers in Rajasthan also found that burden of additional duty provides less time to communicate with farmers. Similarly, Patil *et al.* (2017) ^[15] also reported that extension personnel of the fisheries department in Maharashtra faced constraints like diversified duties and assignments. Jadoun

et al. (2017) ^[5] reported constraints of animal husbandry officials in Haryana, wherein, constraints like heavy workload during peak season followed by the inadequacy of staff were highly severe leading to less time for interaction with farmers. Study conducted by Patel *et al.* (2016) ^[13] reported inadequate staff strength in agriculture department leading to addition work load as foremost constraint faced by extension personnel of Karnataka. This further gives them less time in communicating information to farmers. Pathak *et al.* (2014) ^[14] reported constraints of fisheries extension officers in Assam and W.B. and found that additional duties like census work and election duties provides less time for technical work.

Table 9: Weighted average ranking and Friedman test results for social constraints

S. No.	Constraints	WA	Severity	Rank	NMS*	Mean Rank	Chi-Square Value	Decision
1.	Lack of time to participate in social programmes	11.5	High	I	0.90	3.59	68.886	Reject H ₀
2.	Lack of time to participate in domestic/religious programmes	9.6	High	II	0.75	3.13		
3.	Non availability of residential quarters	1.7	Low	IV	0.13	1.34		
4.	Children's education suffered due to stay in remote places/ frequent shifting due to transfers	4.7	Medium	III	0.37	1.94		
	Overall	6.88	Medium		0.54			

Table 9 shows that the overall the social relations constraints were of medium severity with weighted average of 6.88. Lack of time to participate in social programmes (11.5) and Lack of time to participate in domestic/religious programmes (9.6) were the constraints of high severity, whereas, non-availability of residential quarters (1.7) was least severe. The officials reported that because of busy schedule and burden of work, it is difficult for them to attend social gatherings or religious programmes. 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 (H₀) is rejected ($p < 0.05$).

Misha *et al.* (2016) ^[10] also revealed that the extension personnel in Maharashtra are deprived of social programmes and religious functions because of heavy work load. The study also reported non availability of residential quarters as a major constraint. Similar finding was reported by Patil *et al.* (2017) ^[15] for extension personnel of agriculture department Maharashtra. Yadav (2022) ^[23] also reported similar findings of less time to participate in domestic, religious, and social programmes due to heavy workloads was also reported as a constraint.

Conclusions

It can be concluded from the study that, officials face constraints. To address constraints faced by officials of the Department of Fisheries in Vidarbha region, a comprehensive strategy is needed. Firstly, there should be an assessment of the specific challenges, such as limited resources, inadequate infrastructure, and lack of skilled personnel. Allocating additional funds and resources to the department can help overcome these limitations. Furthermore, capacity-building programs should be implemented to enhance the skills of officials. Training sessions on modern fishing techniques, sustainable aquaculture practices, and effective management strategies can empower officials to address challenges more

Social constraints

The social constraints faced by DoF officials are sub categorized as lack of time to participate in social programmes, lack of time to participate in domestic/religious programmes, non-availability of residential quarters, children's education suffered due to stay in remote places / frequent shifting due to transfers. The weighted average of each sub category under extension and training constraints were calculated and ranked based on severity and non-parametric Friedman test for significant difference among these constraints was computed (Table 9).

efficiently. Collaboration with research institutions and industry experts can provide valuable insights and technological support. Developing partnerships with local communities and encouraging community-based fisheries management initiatives can create a more sustainable and inclusive approach. Investing in technology, such as GPS tracking for monitoring fishing activities and data analytics for better decision-making, can enhance the efficiency of the department. Regular reviews and feedback mechanisms should be established to evaluate the impact of implemented measures and make necessary adjustments. Overall, a multi-pronged approach that combines financial support, capacity building, collaboration, and technology integration is essential to address the constraints faced by officials in the Department of Fisheries in Vidarbha region.

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