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### Analysis of empirical constraints faced by the officials of the department of fisheries, Konkan region, Maharashtra

<sup>1</sup>VG Yewale, <sup>2</sup>KJ Chaudhari, <sup>3</sup>SM Wasave, <sup>4</sup>SV Patil, <sup>5</sup>BM Yadav, <sup>6</sup>AU Pagarkar, <sup>7</sup>BV Naik, <sup>8</sup>SC Kamble and <sup>9</sup>BT Sawant

<sup>1-7-9</sup>College of Fisheries, Dr. Balasaheb Sawant Konkan Krishi Vidyapeeth, Ratnagiri, Maharashtra, India

<sup>8</sup>Diploma in Fisheries Engineering, Dr. B.S. Konkan Krishi Vidyapeeth, Ratnagiri, Maharashtra, India

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Corresponding Author: VG Yewale

#### Abstract

Department of Fisheries (DoF) officials play a key role in developing and implementing various schemes and policies for fisheries development in their respective states. Several fisheries development programmes are implemented in the state for development of marine fisheries. The current study was carried out with the objective of assessing the various constraints faced by the DoF officials in the Konkan region, Maharashtra. Constraints faced by DoF officials were categorised as 'Extension and Training', 'Administrative and Management', 'Technical', 'Input supply', 'Social', 'Feedback', 'Financial', 'Physiological' and 'General'. Weighted average technique was used to analyze and rank various constraints faced by officials. Information was collected from 36 DoF officials from 4 districts of Konkan region of Maharashtra. The study revealed that administrative and management constraints ranked first with weighted average score of 15.09 followed by financial constraints (14.60), input supply constraints (14.50) and social constraints (14.33). Among the administrative and management related constraints pressure from higher officers was highest. In financial constraints salary is less as compared to nature of work ranked first. Highest input supply related constraints were inadequate input supply whereas under the social related constraints less time to participate in social programme ranked first. The study suggested to address the constraints faced by fisheries officials of DoF.

**Keywords:** Constraints, officials, DoF, fisheries

#### Introduction

The fisheries sector has been recognized as a powerful income and employment generator as it stimulates growth of a number of subsidiary industries and is a source of cheap and nutritious food, at the same time it is an instrument of livelihood for a large section of economically backward population of the country. More than 6 million fishers in the country depend on fisheries and aquaculture for their livelihood. Fisheries and aquaculture have emerged as an important commercial activity from its traditional role as subsistence supplementary activity (Kumar *et al.* 2003) [5]. The Maharashtra is endowed with a coastline of 720 km and the area suitable for marine fishing is 1.12 lakh sq. km. There are 15,716 marine fishing boats in operation, of which 13,002 are mechanized. 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. There are 152 fish landing centres on the coastline of the state. The coastal regions of Maharashtra, encompassing districts such as Thane, Palghar, Mumbai (City), Mumbai (Suburban), Raigad, Ratnagiri, and Sindhudurg. These areas serve as critical nodes for marine fishery activities, contributing substantially to the state's overall production metrics. In 2021-22, Maharashtra's marine fish production was documented at 4,32,748 tonnes (DOF, Government of Maharashtra) [2]. The officials from Department of Fisheries (DoF) playing a

key role in developing and implementing various schemes and policies for fisheries development in their respective states. The success of any fisheries or agricultural extension services is primarily dependent on the extension skills of these technical workforce (Kashem *et al.* 2001) [4]. Government interventions in fisheries in the developed maritime nations, through a range of social security measures and subsidies have contributed to strengthening capabilities and reducing vulnerabilities among fisher communities (Kurien 2006) [6]. Union and state fisheries department had implemented various fisheries development programmes in the marine fisheries sector which includes motorization of country craft, providing financial assistance for construction of mechanized fishing vessels, providing subsidy on the purchase of diesel for mechanized fishing vessels, providing subsidy on the VAT for the purchase of diesel etc. These schemes are implemented at various levels such as Central Government through NFDB and NCDC; State Government through Department of Fisheries and Maharashtra Fisheries Development Corporation and District level schemes are implemented by the Department of Fisheries. But often they face various constraints while implementing these schemes. Constraint based studies have been done in other states and union territories like Angral *et al.* (2017) [1] carried out study on in their study on constraints faced by fisheries extension service provider in

Jammu & Kashmir region. Pandey (2009) [9] reported the constraints faced by officials of DoF, Tripura in the transfer of improved aquaculture technologies. Pathak *et al.* (2014) [11] studied problems perceived by Fisheries Extension Officers (FEOs) of Assam and West Bengal (W.B.). Patil and Sharma (2021) [14] prioritized the training needs of extension personnel in Ratnagiri. There are a few studies done with reference to the constraints faced by the DoF officials in context of Maharashtra. Analysing these constraints is very essential for effectively implementation of the scheme and ensure its sustainability. In view of the above, the study was conducted to analyse the constraints faced by the DoF officials in the Konkan region of Maharashtra.

**Materials and Methods**

The study was carried out in the Konkan region of Maharashtra, viz., Palghar-Thane, Raigad, Ratnagiri and Sindhudurg district. A total of 36 fisheries officials from 4 districts of Konkan region i.e. Palghar- Thane, Raigad, Ratnagiri and Sindhudurg district. A thorough review of literature and discussions with an expert group were done in order to list out various constraints faced by officials of DoF. A total of 50 constraints were then categorised under nine heads viz. extension and training, administrative and management, technical, input supply, financial, feedback physiological, social and general.

Interview schedule was used to collect information regarding constraints faced by officials of DoF. A three point Likert scale was used to test the level of agreement of official towards the respective constraints. This scale was 1 to 3, where, 3- most severe, 2 – medium severe and 1 – Not severe, and. Weighted Average (WA) technique was used to rank various constraints faced by fisheries officials. Weighted Mean Score Value was calculated for each constraint. The weighted average was calculated as given below:

$$\text{Weighted average} = \frac{\text{Sum (X1.W1 + X 2.W2 + X3.W3)}{\text{sum (W1+W2 +W3)}}$$

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**

Constraints faced by officials of department of fisheries of Konkan region, Maharashtra were divided into nine categories i.e., extension and training, administrative and management, technical, input supply, financial, feedback, physiological, social and general. Table 1 presents the weighted average obtained for each constraint. It is observed from table 1 that, administrative constraints were the first and foremost ranked constraints faced by officials of coastal districts of Maharashtra with weighted average of 15.09, while financial constraints were ranked as second with weighted average of 14.60, third ranked constraint faced by officials was input supply with weighted average of 14.50 whereas the least ranked constraint was technical constraints with weighted average of 11.81. Friedman rank test, a non-parametric test (distribution-free) used to test if there was a significant difference between each constraint. The result revealed that there was a significant difference among different constraints at a 5% level of significance and the null hypothesis (H<sub>0</sub>) is rejected (p<0.05). This indicates that the constraints affect DoF officials differently depending on the nature of the work they perform. Further discussion on each constraint in detail is discussed as follows.

**Table 1:** Constraints faced by Department of Fisheries Officials

S. No.	Constraints	WA	Rank	NMS	NMS	Mean rank	Chi-Square Value	Decision
1.	Extension and training	13.64	VI	0.66	0.66	5.19	92.29	Reject H <sub>0</sub>
2.	Administrative and Management	15.09	I	0.76	0.76	7.10		
3.	Technical	11.81	IX	0.48	0.48	2.32		
4.	Input supply	14.50	III	0.71	0.71	6.08		
5.	Financial	14.60	II	0.72	0.72	6.14		
6.	Feedback	12.79	VIII	0.57	0.57	3.33		
7.	Social	14.33	IV	0.69	0.69	5.56		
8.	Physiological	13.96	V	0.66	0.66	5.46		
9.	General	12.98	VII	0.58	0.58	3.82		

**Extension and training constraints**

The data in Table 2 depicts extension and training constraints faced by the officials. Non-availability of government vehicles for field visits was ranked first with weighted average of 16.33 followed by insufficient funds for training (15.00), while the least ranked constraint was less availability of job related training with weighted average of 8.83. 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<sub>0</sub>) is rejected (p<0.05) indicated that there is effect of extension and training constraints on DoF officials. The officials of DoF stated that transport facilities were not proper which

are the basic requirement for field visits. This cause difficulty in conducting field visits. similarly, there is insufficient fund for training which lead to problems in organisation of training programme. Rathod *et al.* (2024) [15] also reported insufficient funds for training and lack of transport facilities for field visits. The results are line with the present study. Jadon *et al.* (2017) [3] also reported lack of transportation facilities was a constraint perceived by officials of the Department of animal husbandry in Haryana. Yadav (2022) [17] 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. Patil (2021) [13] 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.

**Table 2:** Extension and training constraints

S. No.	Constraints	Weighted average	Rank	NMS	Mean rank	Chi-Square	Decision
1.	Non-availability of government vehicles for field visits	16.33	I	0.86	4.57	50.93	Reject H <sub>0</sub>
2.	Insufficient funds for training	15.00	II	0.75	3.92		
3.	Insufficient training literature	14.00	III	0.67	3.51		
4.	Lack of need based researches	13.84	V	0.65	3.53		
5.	Lack of skill oriented training	13.83	V	0.64	3.43		
6.	Less availability of job related training	8.83	VI	0.39	2.04		

**Administrative and Management constraints**

Table 3 illustrates the rank order of Administrative and Management constraints. It is observed that pressure from higher officers with weighted average of 17.33 was ranked first by the officials of Konkan region followed by the diversified duties and assignments (WA 16.67) and delay in sanction of Programme/activities (WA 16.34) whereas the least ranked constraint was no separate facility of office with weighted average score of 11.50. 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<sub>0</sub>) is rejected ( $p < 0.05$ ).

The findings of the present study are similar to other studies on constraints faced by extension personnel. Rathod *et al.* (2024) [15] while studying constraints faced by the officials of DoF found that burden of additional duties and diversified duties and assignments. While studying the constraints faced by extension service providers in Rajasthan, Yadav (2022) [17] discovered that the burden of additional duty and non-cooperation from other linked

departments were the most significant administrative and management constraints. Similarly, Patil and Sharma (2021) [13] in their study reported that, fisheries extension personnel from DoF in Maharashtra faced administrative constraints like inadequate staff strength, frequent transfer etc. Jadoun *et al.* (2017) [3] reported on the administrative constraints faced by animal husbandry officials in Haryana, including a heavy workload during peak season and lack of staff. According to a study conducted by Angral *et al.* (2017) [1] in Jammu and Kashmir, DoF officials did not get full cooperation from respondents, causing participation in trainings and technology transfer. According to Patel *et al.* (2016) [10], the most significant administrative constraint faced by Karnataka extension personnel is insufficient staff strength in the agriculture department, which leads to increased workload. Pathak *et al.* (2014) [11] investigated the constraints of fisheries extension officers in Assam and West Bengal, identifying administrative constraints such as late promotion and transfer problems, as well as additional duties such as census work and election duties, as the most significant constraints.

**Table 3:** Administrative and management constraints

S. No.	Constraints	Weighted average	Rank	NMS	Mean rank	Chi-Square	Decision
1.	Pressure from higher officers	17.33	I	0.94	6.53	90.94	Reject H <sub>0</sub>
2.	Diversified duties and assignments	16.67	II	0.89	6.07		
3.	Delay in sanction of programme/activities	16.34	III	0.86	5.85		
4.	Interference of local leaders	16.33	IV	0.85	5.81		
5.	Target oriented approach	15.33	V	0.78	5.18		
6.	Large number of vacant posts	15.17	VI	0.76	5.01		
7.	Inadequate allowances	14.50	VII	0.71	4.51		
8.	Absence of beneficiaries on the day of visit	12.67	VIII	0.56	3.39		
9.	No separate facility of office	11.50	IX	0.46	2.65		

**Technical constraints**

The results of Table 4 reveals that under technical constraints, the lack of information on improved technologies was ranked first (15.17) followed by non availability of latest fisheries literature (14.33) while least ranked constraint was lack of computer literacy (8.33). 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<sub>0</sub>) is rejected ( $p < 0.05$ ).

The results of present study are supported by other studies in India. Rathod *et al.* (2024) [15] studied constraints faced by

the officials of DoF, he stated that technical constraints like lack of information on improved technologies within time was high in severity whereas, lack of internet connection in office was medium severe in the Vidarbha region. Yadav (2022) [17] reported Less availability of the latest fisheries literature as most severe among the extension service providers in Rajasthan. Researchers like Majhi (2001) [7]; Misha *et al.* (2016) [8] and Pathak *et al.* (2014) [11] 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.

**Table 4:** Technical constraints

S. No.	Constraints	Weighted average	Rank	NMS	Mean rank	Chi-Square	Decision
1.	Lack of information on improved technologies within time	15.17	I	0.76	4.85	78.25	Reject H <sub>0</sub>
2.	Non-availability of latest fisheries literature	14.33	II	0.69	4.44		
3.	Lack of internet connection in office	11.83	III	0.49	3.53		
4.	Lack of technical skills to operate audio visual aids	11.67	IV	0.47	3.49		
5.	Non availability of electronic equipment	9.50	V	0.29	2.57		
6.	Lack of computer literacy	8.33	VI	0.19	2.13		

**Input supply constraints**

The data in Table 4 depicts input supply constraints viz. inadequate input supply was ranked first by the officials with weighted average score of 17.33. followed by untimely input supply was ranked second with weighted average core of 15.83. whereas least rank constraint was risk in input supply with weighted average score of 11.17. 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<sub>0</sub>) is rejected ( $p < 0.05$ ).

Similar constraints were studied by many researchers in India and have reported matching results with present study. Rathod *et al.* (2024) <sup>[15]</sup> stated that increased demand for inputs and untimely input supply are constraints with high in severity. Misha *et al.* (2016) <sup>[8]</sup> also reported increased demand of inputs and untimely supply of inputs are severe constraints in transfer of technology in Maharashtra. Patil *et al.* (2017) <sup>[12]</sup> who reported that input supply as the most severe constraint perceived by the extension personnel of the agriculture department of Maharashtra.

**Table 5:** Input supply constraints

S. No.	Constraints	Weighted average	Rank	NMS	Mean rank	Chi-Square	Decision
1.	Inadequate input supply	17.33	I	0.94	4.07	63.86	Reject H <sub>0</sub>
2.	Untimely input supply	15.83	II	0.82	3.50		
3.	Increased demand for inputs	14.67	III	0.72	3.03		
4.	Difficulty in the distribution of inputs to fishers	13.50	IV	0.63	2.61		
5.	Risk in input supply	11.17	V	0.43	1.79		

**Financial constraints**

The results in Table 6 reveal that under the financial constraints, salary is less as compared to nature of work with weighted average of 17.33 was ranked first by the officials of Konkan region followed by inadequate grants for programme/ activities with weighted average score of 16.50. whereas the least ranked financial constraint was untimely salary with weighted average score of 8.83. 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<sub>0</sub>) is rejected ( $p < 0.05$ ).

Patel *et al.* (2016) <sup>[10]</sup>, while studying constraints of extension personnel in Karnataka reported insufficient salary as compared to work load as the second major financial constraint. Similarly, Misha *et al.* (2016) <sup>[8]</sup> also reported the similar financial constraint. Patil *et al.* (2017) <sup>[12]</sup> reported extension personnel of the fisheries department in Maharashtra faced financial constraints like no compensation or incentives for additional work. Patil (2021) <sup>[13]</sup> 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) <sup>[16]</sup> 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) <sup>[3]</sup> in Haryana.

The result of present study meets the results reported by other researchers in India. Pathak *et al.* (2014) <sup>[11]</sup> 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. Rathod *et al.* (2024) <sup>[15]</sup> while studying constraints of officials of DoF of Vidarbha region reported no compensation or incentives for additional work, Salary is less as compared to nature of work and Inadequate grants for programme/activities as the major financial constraints.

**Table 6:** Financial constraints

S. No.	Constraints	Weighted average	Rank	NMS	Mean rank	Chi-Square	Decision
1.	Salary is less as compared to nature of work	17.33	I	0.94	3.90	87.09	Reject H <sub>0</sub>
2.	Inadequate grants for programme/activities	16.50	II	0.63	3.60		
3.	No compensation or incentives for additional work	15.67	III	0.43	3.33		
4.	Untimely grants for programme/ activities	14.67	IV	0.72	2.88		
5.	Untimely salary	8.83	V	0.82	1.29		

**Feedback constraints**

Table 7 presents feedback constraints faced by officials of DoF in Konkan region. The result revealed that among the feedback constraints less response from fishers (14.67) ranked first by the officials of Konkan region followed by no recognition for good work from fishers (14.00). whereas the least ranked constraint was unable to evaluate feedback (10.50). 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 ( $p < 0.05$ ).

The findings of the present study are similar to other studies on constraints faced by extension personnel. Yadav (2022) [17] while studying constraints faced by extension service providers in Rajasthan reported that less response from fishers, less recognition for good work from fishers. Similarly, Angral *et al.* (2017) [11] in their study reported that major constraints faced by implementing agency were low level of people participation. Jadon *et al.* (2017) [3] also reported inadequate cooperation from the animal husbandry farmers in Haryana.

**Table 7:** Feedback constraints

S. No.	Constraints	Weighted average	Rank	NMS	Mean rank	Chi-Square	Decision
1.	less response from fishers	14.67	I	0.72	3.06	33.88	Reject $H_0$
2.	No recognition for good work from fishers	13.67	II	0.64	2.76		
3.	Shyness of fishers	12.33	III	0.53	2.33		
4.	Unable to evaluate feedback	10.50	IV	0.38	1.85		

**Social constraints**

It could be observed from the Table 8 that less time to participate in social programmes was ranked first by the officials with weighted average score of 15.17 followed by less time to participate in family/religious programmes with weighted average core of 14.17. while Children’s education suffered due to stay in remote places / frequent shifting due to transfers with weighted average score 13.67 rank third. Friedman test revealed that there was a no significant difference among the constraints at a 5% level of significance and the null hypothesis ( $H_0$ ) is accepted ( $p > 0.05$ ).

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) [12] for extension personnel of agriculture department Maharashtra. Yadav (2022) [16] 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. Rathod *et al.* (2024) [15] also reported the lack of time to participate in social Programme and lack of time to participate in domestic/religious programmes as a major social constraint.

Misha *et al.* (2016) [8] also revealed that the extension

**Table 8:** Social constraints

S. No.	Constraints	Weighted average	Rank	NMS	Mean rank	Chi-Square	Decision
1.	Less time to participate in social programmes	15.17	I	0.76	2.15	2.91	Accept $H_0$
2.	Less time to participate in family/religious programmes	14.17	II	0.68	1.97		
3.	Children’s education suffered due to stay in remote places / frequent shifting due to transfers	13.67	III	0.64	1.88		

**Physiological constraints**

Physiological related constraints faced by the officials of DoF are presented in Table 9. Major physiological related constraint faced by officials of DoF in Konkan region was always under tension due to political interference (15.17) followed by body pains and illness due to continuous

travelling (14.33), while the least ranked physiological constraint was more field visits with weighted average of 12.67. Friedman rank test results revealed that there was no significant difference among the physiological faced by the officials ( $p > 0.05$ ) as the P-value was 0.030.

**Table 9:** Physiological constraints

S. No.	Constraints	Weighted average	Rank	NMS	Mean rank	Chi-Square	Decision
1.	Always under tension due to political interference	15.17	I	0.76	2.85	8.97	Accept $H_0$
2.	Body pains and illness due to continuous travelling	14.33	II	0.69	2.58		
3.	High tension due to mental and physical work	13.67	III	0.64	2.36		
4.	More field visits	12.67	IV	0.56	2.21		

**General constraints**

Officials of department of fisheries of Konkan region of Maharashtra also faced some general constraints which are presented in table 10. It is clear from table that heavy load of implementation of various schemes and this was ranked first as per the weighted average score of 16.17 followed by less chance for promotion (15.67) ranked second and extra/additional work during natural calamities that affects

routine work ranked third with weighted average score of 15.00, while the least ranked general challenges/constraint was technical literacy among fishers with weighted average of 9.50. 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 ( $p < 0.05$ ).

**Table 10:** General constraints

S. No.	Constraints	Weighted average	Rank	NMS	Mean rank	Chi-Square	Decision
1.	Heavy load of implementation of various schemes	16.17	I	0.85	6.13	94.64	Reject H <sub>0</sub>
2.	Less chance for promotion	15.67	II	0.81	5.85		
3.	Extra/additional work during natural calamities that affects routine work	15.00	III	0.75	5.60		
4.	No awards/rewards for good work	13.83	IV	0.65	4.90		
5.	Difficulty to visit remote sites in monsoon	12.67	V	0.56	4.33		
6.	Misuse of Right to Information Act (RTI)	11.17	VI	0.43	3.58		
7.	More distance from hometown to work area	9.83	VII	0.32	2.90		
8.	Technical literacy among fishers	9.50	VIII	0.29	2.71		

### Conclusion

It can be concluded from the finding of this study that, officials face various constraints while implementing various schemes. To address constraints faced by officials of the Department of Fisheries in Konkan 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 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. To address constraints, interventions are needed to deal with all of its dimensions. Thus, there is a need for integrated approaches for finding solutions to constraints faced by officials in the Department of Fisheries in Konkan region.

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