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# Energising Fisheries Extension: Bridging Skills Gaps for Furthering Development in Haryana and Punjab

<sup>1</sup>Naila M. Bhat, <sup>\*1</sup>Ananthan P.S., <sup>1</sup>Neha W. Qureshi, <sup>1</sup>Shivaji D. Argade, <sup>2</sup>Ponnusamy K., <sup>1</sup>Talib Mohammad

<sup>1</sup> Fisheries Economics, Extension and Statistics Division, ICAR-Central Institute of Fisheries Education, Mumbai, 400061

<sup>2</sup> ICAR-National Dairy Research Institute, Karnal, Haryana, 132 001

### Abstract

A well-prepared workforce is fundamental to the success of any extension organization. Given the rapid technological advancements, it's crucial to continually enhance and refresh the skills of human resources. This study aims to recognize the training requirements of extension personnel within the State Fisheries Department (SFD) in the states of Haryana and Punjab. An organized questionnaire was integrated into an online survey and distributed to both headquarters and district departments. Besides descriptive statistics, the Weighted Sum Method was employed to evaluate training needs, with the scores being standardized. In terms of participation, fisheries district technical SFD staff from Haryana exhibited a 64% response rate, while Punjab recorded a 60% response rate. Gender distribution showed that about 43% of district technical staff in Punjab were female, while 11% in Haryana. Across both states, approximately 45% of the district technical staffs' time was allocated to extension-related tasks. Notably, the primary training needs identified for SFD staff in Haryana included Better Management Practices (0.86), fish health management (0.83), and recent advancements in aquaculture technology (0.83). In Punjab, the top training needs for SFD staff encompassed fish nutrition and feed technology (0.85), fish health management (0.83), and recent technologies in aquaculture (0.83). Therefore, it is advisable to develop training programs aligned with these recognized needs to strengthen the extension system in both states.

### Keywords:

Training Need Assessment, Extension Personnel, Department of Fisheries, Haryana, Punjab

### \*Corresponding author:

[ananthan@cife.edu.in](mailto:ananthan@cife.edu.in)

### Introduction

The success of extension services relies heavily on the readiness and competence of extension agents (Jasmin *et al.*, 2013; Okoedo and Edobor, 2013). Competent extension personnel are valuable assets to the extension organization (Rohit and Beevi, 2017). In developing countries, there is a high demand for numerous well-trained extension agents to cater to the needs of farmers effectively (Van Crowder *et al.*, 1998). To meet this demand, it is crucial to identify areas where extension agents lack proficiency and provide them with the necessary training. Training involves assisting individuals to enhance their effectiveness and efficiency in their work. It is widely acknowledged that training plays a significant role in improving the professional capabilities of extension personnel, enabling them to effectively transfer technology to the farming community (Panjshiri *et al.*, 2018). Regularly assessing the technical competence and job performance of extension agents is essential to meet the evolving demands of their role (Yondeowei and Kwarteng, 2006). As the training requirements of extension personnel change over time due to technological advancements and new information delivery systems, regular training needs assessments should be conducted. When planning training

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programs for extension personnel, it is essential to consider the critical areas where they need improvements (Man *et al.*, 2016). The dynamic nature of technology and information systems also contributes to the changing training needs of extension personnel (Nongtdu *et al.*, 2012). Allo (2001) highlighted that the lack of information on specific training needs for agricultural professionals was the greatest challenge in developing effective training programs in developing countries. Delivering quality extension services foster the adoption of new agricultural practices and enhances farm productivity and income (Agholor *et al.*, 2013). To keep up with the evolving clientele's needs, extension professionals must continuously upgrade and update their skills. In this context, capacity building for extension professionals becomes essential to enhance production. With these considerations, the present investigation was planned with specific objective of analyzing training needs of extension staff of State Fisheries Department (SFD), whose one of the mandates is to provide quality fisheries related extension services.

## Materials and methods

The research was carried out in the states of Punjab and Haryana, focussing on the technical fisheries staff employed with the state fisheries department who are posted at the *district and field offices*, and are expected to perform extension related work. The structured questionnaire developed by Ananthan *et al* (2021) and validated by Geetha (2022) and Deboshmita *et al* (2022) for the training need assessment of KVK-SMS was adapted for the present study. It was transformed into an online survey using the Google Form. The questionnaire covered the respondents' general profile information, time spent on performance of different activities, information sources, and training requirements. By examining existing literature and expert discussion, a comprehensive list of training areas where training might be required and or preferred was prepared, and included in the questionnaire.

The online form was sent to *all* the technical fisheries staff in Punjab and Haryana through their respective Directorate of Fisheries. The Google Form link was shared through email and WhatsApp contact numbers. To ensure comprehensive coverage, repeated follow-ups were made with district officers and the directorates to obtain response from *each of the districts* in both states. Punjab has 23 districts and Haryana has 22 districts. This way, at least one response from each district office was secured. A total of 91 responses were collected with the response rate of fisheries officers being 71% (38) in Haryana and 61% (53) in Punjab. The collected data was tabulated and further analysed using both descriptive and inferential statistics namely, percentage analysis, Weighted Sum Method (WSM), and the Mann Whitney U test. The training needs for each thematic

area identified were calculated using the WSM adopting the following formula:

$$\text{WSM Score} = \frac{\text{Sum } (x_1 \cdot w_1 + x_2 \cdot w_2 + x_3 \cdot w_3)}{\text{Sum } (w_1 + w_2 + w_3)}$$

where,  $x_1, x_2, x_3$  = frequency of the respective needs;  
 $w_1, w_2, w_3$  = weighted values

The scores were then normalised using the standardisation procedure, making them easy to compare. Mann Whitney U test, using the formula below, was used to test whether training needs of district technical staff in the two states differed significantly. The analysis was done using SPSS version 22 software.

$$U_1 = n_1 n_2 + \frac{n_1 (n_1 - 1)}{2} - R_1$$

$$U_2 = n_1 n_2 + \frac{n_2 (n_2 - 1)}{2} - R_2$$

Where,

$U_1$  = Mann-Whitney statistic for group 1,

$U_2$  = Mann-Whitney statistic for group 2

$n_1$  = Number of samples in group 1,

$n_2$  = Number of samples in group 2

$R_1$  and  $R_2$  = Sum of ranks in group 1 and group 2 respectively.

## Results and discussion

### Human resource status of State Fisheries Departments

State fisheries departments (SFD), like any other development departments, are staffed by technical or subject matter experts as well as non-technical staff who may be categorised as administrative and support staff. Technical staff form the backbone of any *development* department as they steer the engine of growth by implementing key developmental programs, and extending technological assistance and support at the field level, be it at the district, block or panchayats. The SFDs in Haryana and Punjab had a sanctioned cadre strength of 655 and 505 as on March 2023 with about two-third of them constituting technical cadre in each state. What is alarming though is that nearly 55% of total staff positions were vacant in Haryana and about 49% in Punjab. More strikingly, vacancy was higher among the technical cadre compared to the cadre of admin and support staff as two out of every three (68%) technical staff positions were lying vacant in Haryana and more than half of them (54%) in Punjab. This inherently limits the capacity of the SFD to carry out field level extension and developmental work. A decade ago, in 2010-11, the total vacancy was only 25% while technical cadre vacancy was 31% in Haryana SFD Haryana (Haryana Kisan Ayog, 2012), which indicates that the vacancy position has doubled during the past 11 years. There was hardly any new requirement to fill the vacant positions arising out of increasing rate of retirements.

**Table 1:** Human Resource status of SFD

|                                 | Sanctioned | Filled    | Vacant    |
|---------------------------------|------------|-----------|-----------|
| <b>Total staff strength</b>     |            |           |           |
| Haryana                         | 655        | 299 (46%) | 366 (56%) |
| Punjab                          | 506        | 259 (51%) | 247 (49%) |
| <b>Technical staff strength</b> |            |           |           |
| Haryana                         | 418        | 113 (32%) | 286 (68%) |
| Punjab                          | 329        | 152 (46%) | 177 (54%) |

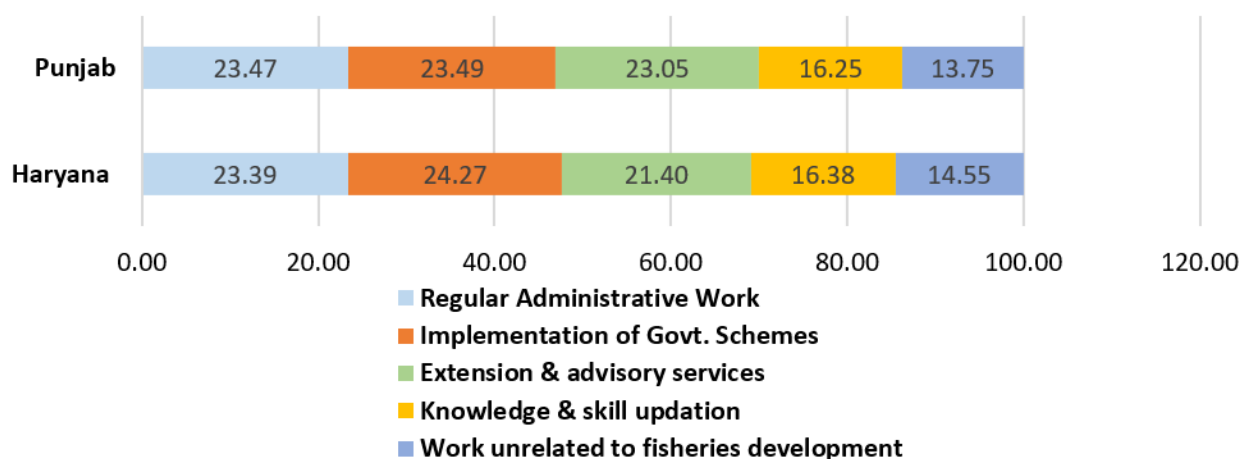
**General profile of SFD technical staff**

In Punjab, women constituted a significant percent of technical positions in the district SFD offices (43%). However, in Haryana, women held only 11% of similar technical positions, highlighting their under representation, extension services continue to be men-dominated as reported by Thanh and Singh (2007) who found that most of the Indian extension personnel were men. About 73.68 % of SFD technical staff in Haryana had B.Sc. as their educational qualification, and only few (7.89%) had professional Fisheries degrees. This can be attributed to the absence of a fisheries college (and thus B.F.Sc. graduates) in the state till recently (2019 Fisheries college was established in state) as well as the extant recruitment rules that doesn't require or prefer B.F.Sc degree as an essential qualification unlike many other states. In contrast, 56.60 % of SFD technical staff in Punjab had professional degrees (B.F.Sc. or M.F.Sc.) as their educational qualification, which was made feasible due to the presence of a fisheries college in the state as well as the preference given to professional graduates in recruitment. It underscores the need for the Haryana SFD to reform its recruitment rules and capitalise on the professional graduates coming out of its new fisheries college in Hisar, besides increasing the representation of women and making it more inclusive.

**Table 2.** Profile characteristics of SFD technical staff in the districts

| Variables                        | Haryana<br>n=38 (%) | Punjab<br>n=53 (%) | Total<br>n=91 (%) |
|----------------------------------|---------------------|--------------------|-------------------|
| <b>Gender</b>                    |                     |                    |                   |
| Men                              | 89.00               | 57.00              | 70.40             |
| Women                            | 11.00               | 43.00              | 29.6              |
| <b>Educational Qualification</b> |                     |                    |                   |
| B.Sc.                            | 73.68               | 33.96              | 50.55             |
| B.F.Sc.                          | 5.26                | 20.75              | 14.29             |
| M.Sc.                            | 15.79               | 7.55               | 10.99             |
| M.F.Sc.                          | 2.63                | 35.85              | 21.98             |
| Any Other Degree                 | 2.63                | 1.89               | 2.20              |
| <b>Work Experience</b>           |                     |                    |                   |
| < 1 year                         | -                   | 9.43               | 5.49              |
| 1 - 3 Years                      | 5.26                | 16.98              | 12.09             |
| 3 - 5 years                      | 2.63                | 15.09              | 9.89              |
| 5 - 10 years                     | -                   | 22.64              | 13.19             |
| >10 years                        | 92.10               | 35.84              | 59.34             |
| Average Work Experience (years)  | 13                  | 8                  | 10                |

The average working experience of SFD technical staff in Haryana was 13 years and 8 years in Punjab. In Haryana, about 92% of SFD technical staff had work experience of more than 10 years, it was only one-third who had similar experience in Punjab (35.84%), reflecting also predominance of their relatively younger age profile and the recent recruitment. Dey *et al.* (2023) reported that in West Bengal, the majority (45%) of the KVK-SMS had a service length of less than five years whereas in Bihar, the majority (43%) of the respondents had service length of less than a year. Kumaran *et al.* (2011) in their study in Andhra Pradesh, Gujarat and Tamil Nadu reported that about 40% of Fisheries Extension Officers had more than 10 years and 20 years of experience, respectively in the

**Fig. 1** Time spent by SFD technical staff on extension and other activities

fisheries departmental activities. Overall, SFD in both states have experienced staff.

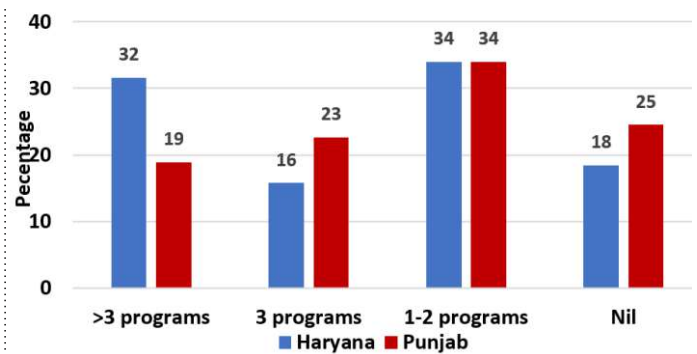
#### **Time spent by SFD technical staff on different activities**

The time allocation of SFD technical staff across various activities can significantly impact their productivity and the effectiveness of their roles. Typically, the time spent by SFD technical staff can vary based on the nature of their responsibilities and the demands of their job profiles.

In Haryana and Punjab, the time spent by SFD technical staff on different activities was more or less similar. The three major activities, in terms of time spent, are implementation of government schemes, administrative work, and provision of extension services, wherein 21-24% of their time was spent on each of them in both states. It was also heartening to note relatively less time (14%) was spent on 'work unrelated to development', while nearly 16% of the time was spent to upgrade 'knowledge and skill'. Nearly one fourth of the time was spent on 'administrative work' is a concern. Higher vacancy rate, and the absence of digitisation of many routine works could be cited as reasons. However, a similar investigation conducted by Deboshmita (2022), focusing on KVK Subject Matter Specialists in Bihar and West Bengal, revealed a more positive scenario, with SMS dedicating a substantial amount of their time (65%) to extension-related tasks. This outcome is encouraging. Therefore, it is crucial to alleviate the administrative workload for extension personnel in the Fisheries Department, enabling them to allocate more attention to extension activities.

#### **Skill development programs attended by SFD technical staff**

Various skill development programs are tailored for extension workers to bolster their abilities and efficacy in their positions. Given their responsibility to train



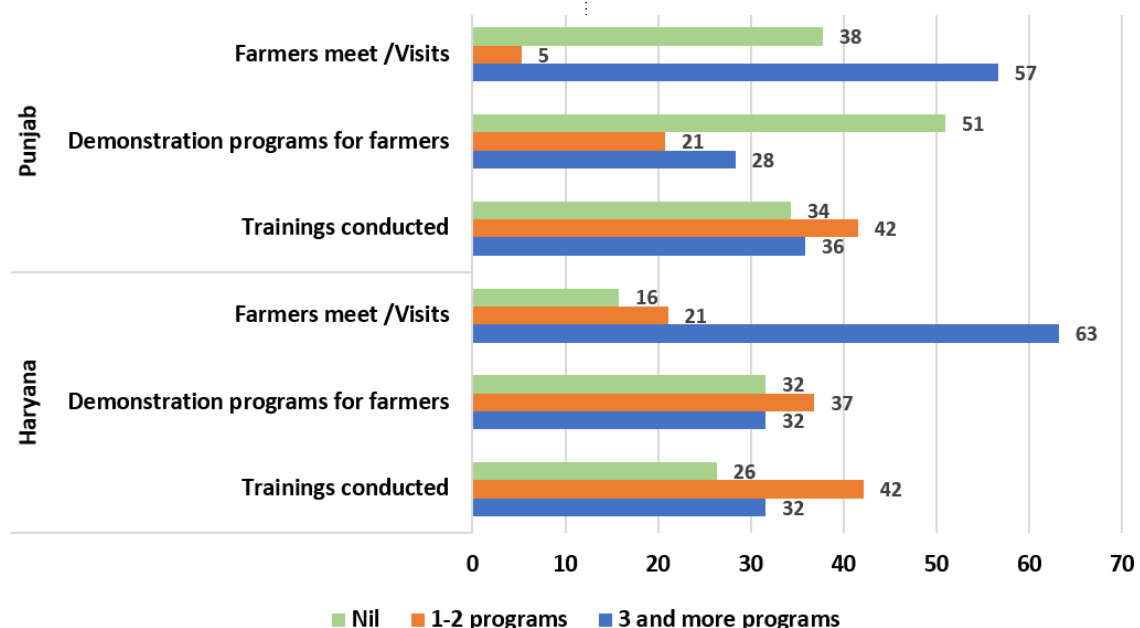
**Fig. 2.** Number of skill development programs (SDP) attended by SFD technical staff

farmers on latest technologies, it's imperative to elevate their own skills accordingly.

About 32 % of technical staff in Haryana and 19 % in Punjab attended more than 3 skill development programs during 2019-20 to 2021-22. About 18 % in Haryana and 25 % of technical staff didn't attend any skill development programs suggesting a deficit in the frequency of training programs aimed at updating their skill sets. Thus, more need-based training programs can be designed for extension personnel. Haleem (2018) in Nigeria reported the majority (65%) of extension workers had attended more than 10 in-service trainings.

#### **Extension related activities conducted by SFD technical staff**

SFD technical staff is mandated to perform various extension activities which include training farmers, demonstration programs for farmers, farmer meets and visits etc. These activities collectively aim to enhance productivity, sustainability, and the socio-economic well-being of farmers within the region served by the SFD.



**Fig. 3** Type and no. of extension activities conducted by SFD technical staff in Haryana and Punjab

**Table 3.** Training needs of SFD technical staff in districts

| Training needs`                               | Haryana (n=38) |      | Punjab (n=53) |      | Sig.  |
|-----------------------------------------------|----------------|------|---------------|------|-------|
|                                               | Scores         | Rank | Scores        | Rank |       |
| Fisheries related Training needs              |                |      |               |      |       |
| Better Management Practices                   | 0.86           | 1    | 0.81          | 3    | 0.52  |
| Fish Health Management                        | 0.83           | 2    | 0.83          | 2    | 0.71  |
| Recent Technologies in Aquaculture            | 0.80           | 3    | 0.83          | 2    | 0.69  |
| Fish Breeding and Seed Production             | 0.78           | 4    | 0.74          | 4    | 0.54  |
| Fish Nutrition and Feed Technology            | 0.78           | 4    | 0.85          | 1    | 0.26  |
| Conservation of Fisheries Resources           | 0.68           | 5    | 0.58          | 7    | 0.80  |
| Fisheries Marketing / Value Addition          | 0.68           | 5    | 0.72          | 5    | 0.20  |
| Fish Stock Assessment Methods                 | 0.68           | 5    | 0.47          | 9    | 0.77  |
| Fisheries Governance / Regulations            | 0.68           | 5    | 0.59          | 6    | 0.01* |
| Ornamental Fish Rearing / Aquarium Management | 0.49           | 6    | 0.52          | 8    | 0.80  |
| Extension related Training needs              |                |      |               |      |       |
| ICT Applications / Extension Methods          | 0.62           | 2    | 0.53          | 2    | 0.24  |
| Human Resource Management                     | 0.62           | 2    | 0.59          | 1    | 0.25  |
| Project Management / Monitoring & Evaluation  | 0.59           | 3    | 0.47          | 3    | 0.83  |
| Field Data Collection, Analysis & Reporting   | 0.66           | 1    | 0.43          | 4    | 0.01* |

\*Significant at 0.05 level of significance

It was found that about 26% SFD technical staff in Haryana and 34% in Punjab didn't conduct any training program during 2019-20 to 2021-22. This suggests a gap in imparting necessary knowledge and skills to farmers, which could hinder development. About 32% in Haryana and 51 % in Punjab didn't conduct demonstration programs for farmers. Demonstrations are crucial for showcasing new techniques and technologies, and their absence might limit farmers' exposure to advancements in aquaculture. A notable proportion of technical staff (16 % in Haryana and 38 % in Punjab) didn't visits farmers. This lack of direct interaction might impact the availability of personalized advice and support to farmers. Thus, a fair percentage of SFD technical staff were conducting extension related activities, however, the frequency of such events can be increased for further development of fisheries sector. In Punjab, higher percentage of SFD technical staff didn't conduct demonstration programs and farmer visits, this may be attributed to lack of official vehicle in majority (61%) of district SFD offices. This could hinder the mobility and outreach capabilities of the staff.

Addressing these issues, such as providing adequate resources like official vehicles and emphasizing more frequent and varied extension activities, could enhance the impact and effectiveness of the SFD technical staff in both regions, ultimately contributing to the growth of the fisheries sector.

#### **Training need assessment**

The identification of training needs for outreach personnel is vital. Regular assessment of training requirements is imperative due to the swift evolution of technology. Training needs of SDF technical staff in

districts of Haryana and Punjab are given below in the table 3.

Training on Better Management Practices with the score of 0.86, followed by fish health management (0.83) and recent technologies in aquaculture (0.83) were among the top reported training needs of extension personnel in Haryana. Fish nutrition and feed technology with the score of 0.85 followed by fish health management (0.83) and recent technologies in aquaculture (0.83) were among the top training needs of district technical staff in Punjab. These aspects are crucial as they directly impact the sustainability and productivity of aquaculture endeavours, especially in regions affected by soil salinity. Both the states are primarily agrarian states but recently the increasing salinity of the soil has led to a surge in the growth of inland saline aquaculture. Farmers are taking up shrimp culture in water logged areas, which can affect sustainability if it is not taken care of. Thus, SFD technical staff in both states were interested in training on BMPs and recent technologies of aquaculture. The primary source of fish production in Haryana and Punjab is intensive culture in Panchayati and private ponds. This dominance might explain the relatively lesser emphasis on training related to the conservation of fisheries resources and fish stock assessment, given the limited availability of capture fisheries resources in these regions.

Among extension related training needs field data collection, analysis & reporting ranked top in Haryana. The emphasis on field data collection, analysis, and reporting indicates a strong demand for skills related to gathering data, interpreting it effectively, and presenting it in a comprehensible manner. This priority

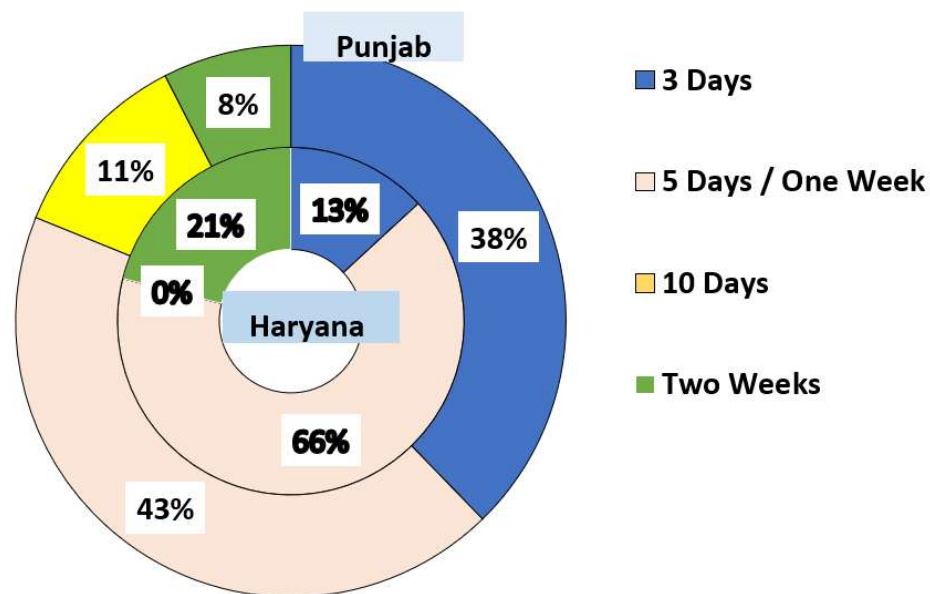


Fig. 4 Duration of training program preferred

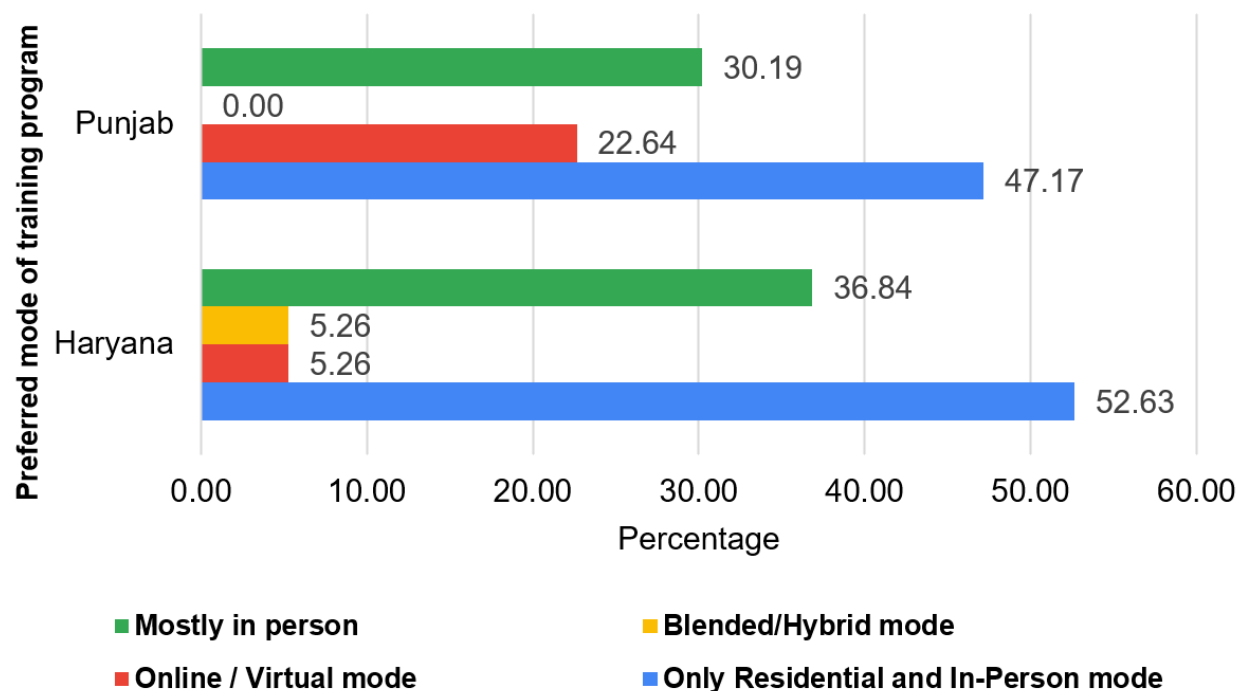


Fig. 5. Preferred mode to attending training program by SFD technical staff

suggests a focus on evidence-based decision-making, where technical staff may require training to gather accurate information and analyze it for better aquaculture practices and policy formulation. Human resource management ranked top in Punjab. This emphasis indicates a need for training in leadership, team-building, effective communication, and strategic resource allocation among the extension staff in Punjab.

Addressing these training needs would significantly benefit technical staff in both regions, empowering them with the necessary skills to meet the unique

challenges and requirements within their respective sectors.

However, when comparing the training needs of SFD technical staff between Haryana and Punjab, the Mann Whitney U test indicated that there was no significant difference, except for Fisheries Governance/ Regulations and Field Data Collection, Analysis & Reporting, where the needs differed. It was observed that there was relatively less interest in ornamental fish rearing. Comparatively less preference for the ornamental fish rearing might be either due to pre-existing knowledge or their perceived non-relevance in

their area. A study conducted by Dey *et al.*, in 2023 on training needs assessment of SMS (Subject Matter Specialists) in Bihar and West Bengal found that SMS expressed the highest training requirements in Entrepreneurship Development, Success Story Documentation, and Best Management Practices.

#### **Duration of Training program preferred by SFD technical staff**

Extension personnel often prefer training programs that align with their work schedules and commitments. Preferences for the duration of training programs could vary based on several factors, including job responsibilities, workloads, and the need to balance professional development with daily tasks.

Fig. 4 illustrates that 66% of SFD technical staff in Haryana and 43% in Punjab preferred training programs lasting 5 days or one week. These findings align with study by Geetha (2022), which showed that KVK SMS professionals in Andhra Pradesh and Tamil Nadu also preferred shorter duration training programs due to their heavy work commitments, preventing prolonged absence from their KVKs.

As a result, it is recommended to design training programs that are concise, modular, and adaptable to suit the demanding schedules of these professionals. By offering shorter yet focused training sessions, it becomes more feasible for SFD technical staff to participate without compromising their responsibilities and commitments at work. This approach ensures that the training programs are more accessible and can be effectively integrated into their busy work routines, maximizing their learning outcomes and the practical application of the acquired knowledge and skills in their respective roles.

#### **Preferred mode to attending training program by SFD technical staff**

The preferred mode of attending training programs among SFD technical staff can vary based on several factors, including accessibility, convenience, and the nature of the training content.

From Fig. 5, it is clear that majority of the extension staff in both states, Haryana (52.63%) and Punjab (47.17%) were interested in attending residential and in-person training programs. This preference highlights a significant inclination towards traditional training formats that involve physically attending workshops, seminars, or training sessions conducted in a residential setting.

However, it's important to note that while a significant portion prefers residential and in-person training, there were a substantial number of individuals who prefer other formats, such as online or hybrid modes. Factors influencing this preference could include personal circumstances, work commitments, or geographic constraints.

## **Conclusion**

A proficient workforce is a valuable asset for any organization, and their competence is crucial since the success of an organization hinges on the calibre of its human resources. The study revealed that in Punjab, women hold a significant portion of technical positions in district SFD offices (43%), contrasting with Haryana's notable underrepresentation of women (11%). Haryana's SFD primarily comprises B.Sc. graduates (73.68%), indicating a need to reform recruitment rules to embrace professional graduates and enhance women's representation, aligning with an evolving, inclusive approach. Technical staff in both states spent one-fourth time on administrative roles. Thus, highlighting that the administrative work loads of SFD technical staff should be alleviated by filling the vacant positions. A notable proportion of technical staff conducted less extension related activities in last 3 years, thus emphasizing more frequent extension related activities should be undertaken by them. Training needs assessment among extension personnel in Haryana and Punjab underscored the critical necessity for enhancing expertise in aquaculture-specific areas like Better Management Practices, fish health management, and recent technologies, crucial for addressing challenges posed by soil salinity and promoting sustainability; additionally, the distinct priorities in Haryana, focusing on data collection and analysis for evidence-based decision-making, and in Punjab, emphasizing human resource management, highlight tailored training needs aligning with regional demands for informed policy formulation and effective leadership. Majority of the technical staff preferred shorter duration and In-person training programs. The creation of training modules tailored to those specific needs of SFD technical staff must be taken up. Concise and demand driven training programs must be designed for extension personnel.

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#### **Conflict of interest:**

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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