



Training Needs of Member Fish Farmers of FFPOs in Purba Medinipur District of West Bengal

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HIGHLIGHTS

- Medium to high training needs was recorded in 78 per cent of respondents. Key priorities were fish disease control and feeding strategies.
- Most farmers practiced mixed fish farming, and preferred trainers were private staff and input dealers with fisheries institutes and government officials also playing roles.
- Despite FFPO training support, broader extension agency involvement is essential to meet fish farmers' evolving training demands and boost fish production.

ARTICLE INFO

Keywords: Fish farmers producer organization, Fish farmers, Training need.

<https://doi.org/10.48165/IJEE.2025.611RN04>

Conflict of Interest: None

Research ethics statement(s):

Informed consent of the participants

ABSTRACT

The study assessed the training needs of fish farmers who are members of FFPO in the Purba Medinipur District of West Bengal in 2023. The study used a descriptive design, collecting primary data from 120 fish farmers across four FFPOs through semi-structured questionnaire and interviews. The study identified the key training needs of the FFPO members. The primary areas requiring attention included fish disease management (identification and control) ($\bar{x} = 3.2$), feeding strategies and feed formulation ($\bar{x} = 3.02$), water quality management ($\bar{x} = 3.0$), fish breeding ($\bar{x} = 2.67$), pond construction or renovation ($\bar{x} = 2.65$), marketing strategies ($\bar{x} = 2.61$), and selection of quality seed, species, and stocking density ($\bar{x} = 2.52$). Overall, most members exhibited medium (52.5%) to high (25.83%) training needs. There is a need for targeted training in these critical areas to improve fish-farming practices. Preferred trainers included private staff, input dealers, and medicine company representatives (77.5%), followed by fisheries institutes (65%) and government officials (40.83%). The study concluded that while FFPOs provide valuable training, there is a need for additional effort from other extension agencies to address the identified training gaps.

INTRODUCTION

Fishery and aquaculture sectors are vital to India's economy, contributing to national income, nutritional security, employment, social objectives, and export earnings (Dhara et al., 2016; Mallick, 2017; Eseroghene & Ikechukwu, 2018). These sectors have evolved from traditional subsistence activities to diversified commercial enterprises with untapped potential (Mahanayak & Panigrahi,

2024). They provide livelihoods for millions of fishermen and fish farmers who are central to India's socioeconomic framework through food production, job creation, and income generation (India CSR, 2023; IBEF, 2022; Rajeev & Bhandarkar, 2022). Recognizing the need to support small-scale fish farmers in achieving sustainable practices and improved socioeconomic conditions, initiatives such as the Pradhan Mantri Matsya Sampada Yojana (PMMSY) have facilitated the formation of Fish Farmer Producer Organizations

(FFPOs) (Ministry of Fisheries, Animal Husbandry & Dairying, 2023; Rani, 2022). These organizations aim to enhance fish farmers' skills, livelihoods, and long-term sustainability in the fisheries value chain.

Improved understanding of market dynamics, better targeting of interventions, enhanced competitiveness, increased economic opportunities and improved policy making are few strong areas of FPOs (Singh et al., 2023). FPOs are help reducing transactional costs (Parthiban et al., 2015). Fish farmers can boost their income in three main ways: purchasing farming inputs at reasonable prices via collective bargaining, enhancing their skills through targeted training, and securing better prices by reducing reliance on middlemen. Skill enhancement and capacity building are crucial for increasing farmers' income. FFPOs serve as collective platforms that enable farmers to improve profitability by offering various services. These include bulk purchasing of inputs at lower costs while maintaining quality, providing need-based training, linking farmers to governing bodies, and offering financial and advisory support from experts (Kumari et al., 2022; Pati, 2022; Mondal et al., 2023). To maximize the benefits, it is crucial to assess the training needs of FFPO members to identify areas for skill enhancement. This assessment will guide FFPOs and extension agencies in determining where to focus their training efforts, ultimately enabling farmers to increase their profits and improve their livelihoods.

Training equips individuals with the knowledge, skills, and attitudes necessary for improved performance (Meenambigai & Seetharaman, 2003). It bridges the gap between actual and desired performance, enhancing farmers' confidence in managing issues, minimizing risks, improving productivity, and adapting to new technologies (Makwana & Bhatt, 2021; Famuwagun, 2015). Purba Medinipur District in West Bengal is a prominent fish farming hub, supported by abundant water resources and a thriving fishery sector that significantly contributes to local socioeconomic development. Assessing the training needs of small-scale fish farmers is essential; however, existing studies lack a scientific analysis of the training needs of FFPO members. While FFPOs organize need-based training on the technical and marketing aspects of fish farming, there are still critical areas that require attention from FFPO officials, extension agencies, and government bodies. So, the specific objective of the study is to assess the training needs of the member fish farmers of the FFPO.

METHODOLOGY

The study was carried out in the Purba Medinipur District of West Bengal in 2023. Out of fourteen Fish Farmers Producer Organizations (FFPOs) in the district (District Controller, Food & Supply, Purba Medinipur, 2022), four were selected for the study based on specific criteria: operational success of over 3 years, significant membership (over 400 members), and a turnover exceeding Rs. 1 crore in the fiscal year 2021–2022, as verified by audit reports. The chosen FFPOs were Tamralipta Fish Producer Company Limited, Global Moyna Farmers Producer Company Limited, Divinius Farmers Producer Company Limited, and Patashpur-II Farmers Producer Company Limited. Thirty respondents were selected from each FFPO, totalling 120 respondents, using a simple random sampling without replacement

technique. Descriptive research design was employed and primary data were collected through a semi-structured interview schedule. For identification of major thrust area of training need and extent of training need, responses from the respondents were rated on four-point continuum viz., most needed, needed, least needed and not needed by assigning a score of 4, 3, 2 and 1, respectively followed by Hijam et al., (2015). The sum of the mean rating scale was divided by 4 that is, $(4+3+2+1=10/4 = 2.50)$. Any mean score greater than or equal to 2.50 was regarded as the training needs for the fish farmers in the study area. Further the respondents were grouped into three categories based on mean and standard deviation. The relationship between two categorical variables of such independent variables and training need was checked by implementing a non-parametric test of chi-square value estimation to draw a conclusion.

RESULTS

The study identified the areas of training need by the members of FFPO. It was revealed that some broad areas which had the more thrust of training need (depicted in Table 1) were fish disease related (identification and control) ($\bar{x} = 3.2$), feeding strategy and feed formulation ($\bar{x} = 3.02$), water quality management ($\bar{x} = 3.0$), fish Breeding ($\bar{x} = 2.67$), new pond construction or old pond renovation ($\bar{x} = 2.65$), marketing strategy ($\bar{x} = 2.61$), selection of quality seed and species and their stocking density ($\bar{x} = 2.52$). other areas also should be look after like integrated farming ($\bar{x} = 2.3$), harvesting techniques ($\bar{x} = 2.23$), ongoing culture management (liming, fertilizing, fish health monitoring etc.) ($\bar{x} = 2.19$), combination of fish species to be stocked ($\bar{x} = 2.14$), value addition ($\bar{x} = 2.03$), diversified aquaculture and system diversification ($\bar{x} = 2.01$).

With regard to level of training need of the respondents (presented in Table 2), it was found that the majority of respondents (52.5%) reported a medium level of training need followed by 25.83 per cent of respondents indicated a high level of training need and 21.67 per cent of respondents reported a low level of training need.

Table 1. Percentage distribution of respondents on training needs on different aspect of aquaculture (N=120)

S.No.	Broad areas of training need	Mean Score ($\bar{x}$)
1.	New pond construction or old pond renovation	2.65*
2.	Water quality management	3*
3.	Selection of quality seed, species and their stocking density	2.52*
4.	Combination of fish species to be stocked	2.14
5.	Feeding strategy and feed formulation	3.02*
6.	Ongoing culture management (liming, fertilizing, fish health monitoring etc.)	2.19
7.	Integrated farming	2.3
8.	Fish Breeding	2.67*
9.	Diversified aquaculture and system diversification	2.01
10.	Fish disease related (identification and control)	3.2*
11.	Harvesting techniques	2.23
12.	Value addition	2.03
13.	Marketing strategy	2.61*

Source: (Field Survey, 2023)

Mean cut off = 2.5 (*means training need)

Table 2. Distribution of respondents according to their level of training need (N=120)

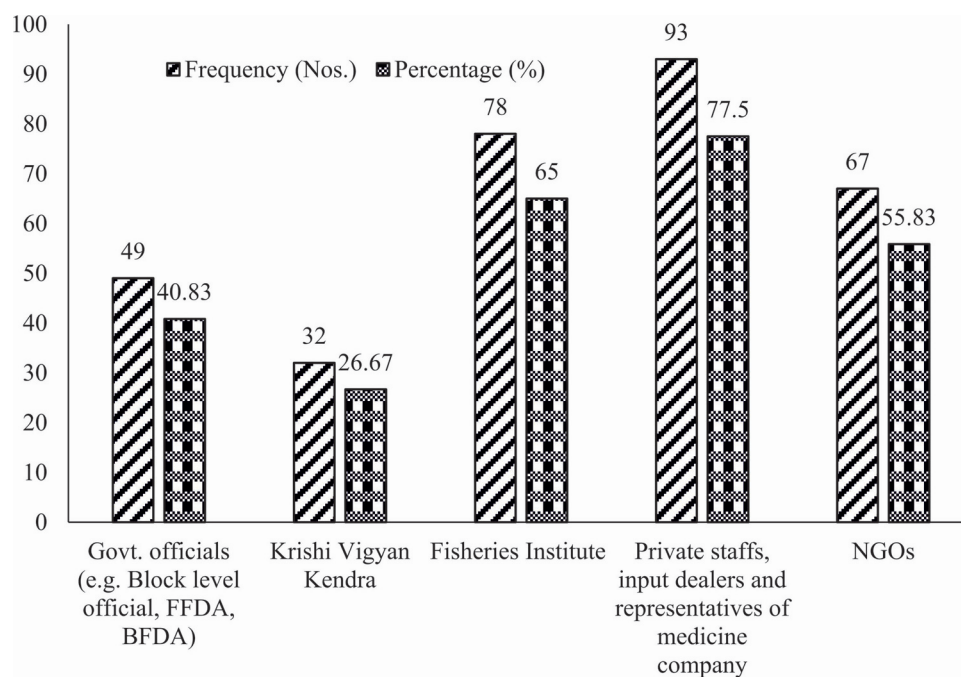
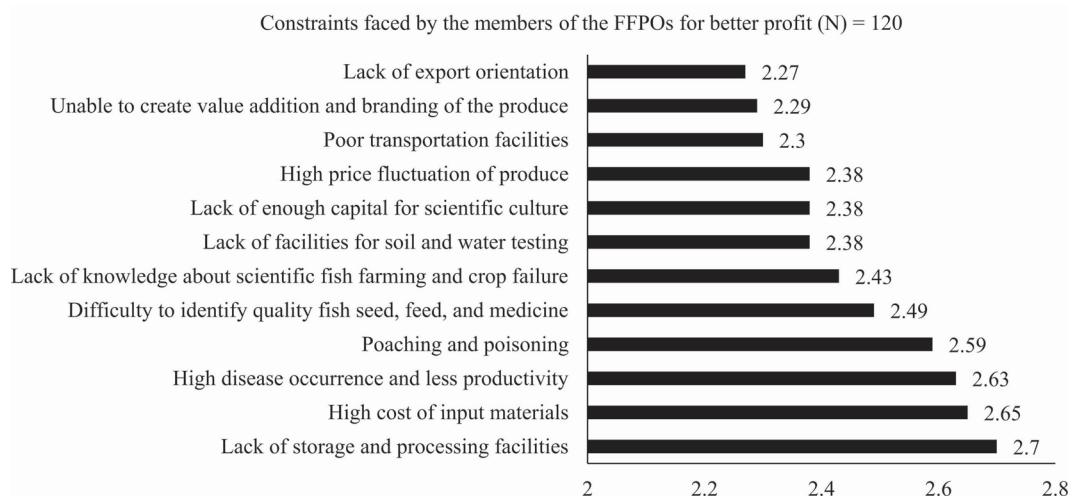
S.No.	Level of training need	Frequency (Nos.)	Percentage (%)	Rank
1.	Low (<27.54)	26	21.67	3
2.	Medium (27.54 to 37.66)	63	52.5	1
3.	High (>37.66)	31	25.83	2

Mean = 32.6; Standard Deviation = 5.06

Regarding the preferred extension agency for training purpose (Figure 1), it was revealed that the majority of respondents (77.5%) preferred training to be conducted by private staff, input dealers, and representatives of medicine companies. This was followed by 65 per cent who preferred fisheries institutes, and 55.83 per cent who favoured NGOs as their training providers. Additionally, 40.83 per cent of respondents preferred government officials, such as block-level officials (Fishery Extension Officers), Fish Farmers

Development Agency (FFDA) and Brackish water Farmers Development Agency (BFDA), while 26.67 per cent expressed a preference for Krishi Vigyan Kendra.

Based on the constraints faced by members of the FFPOs for achieving better profit (Figure 2), the highest-rated challenges included the lack of storage and processing facilities, with a mean score of 2.7. This is followed closely by the high cost of input materials (2.65) and high disease occurrence with less productivity (2.63). Poaching and poisoning also present a significant challenge with a mean score of 2.59. Difficulty in identifying quality fish seed, feed, and medicine scored 2.49, and lack of knowledge about scientific fish farming and crop failure was rated at 2.43. Other notable constraints included a lack of facilities for soil and water testing, insufficient capital for scientific culture, high price fluctuation, poor transportation facilities, and inability to create value addition and branding of produce. The lowest-rated constraint was the lack of export orientation, with a mean score of 2.27.

Figure 1. Distribution of respondents on preferred extension agency to conduct training through FFPO**Figure 2.** Distribution of respondents based on constraints faced by the members of the FFPOs

Further, the relations of independent variables (demographic profile of the respondents) and dependent variable (training need) is assessed by the estimation of Cramer's V value in Chi-statistics (Lee, 2016) (Table 3). It was found that some variables having very strong (Cramer's V 0.80 – 1.00) relation with training need like farming experience ($\chi^2 = 199.751^*$, Cramer's V = 0.912), occupation ($\chi^2 = 94.765^*$, Cramer's V = 0.889), economic motivation ($\chi^2 = 186.595^*$, Cramer's V = 0.882), annual income ($\chi^2 = 177.089^*$, Cramer's V = 0.859), risk orientation ($\chi^2 = 176.708^*$, Cramer's V = 0.858), number of training attended ($\chi^2 = 165.043^*$, Cramer's V = 0.829), education ($\chi^2 = 160.112^*$, Cramer's V = 0.815), and Scientific orientation ($\chi^2 = 153.968^*$, Cramer's V = 0.801).

Table 3. Association between demographic profile and training need of member fish farmers of FFPO

Variables	Pearson Chi square (χ^2) value
Age (chronological year)	149.005*Cramer's V value = 0.788
Education (class)	160.112*Cramer's V value = 0.817
Farming experience (year)	199.751*Cramer's V value = 0.912
Farming area (Acre)	151.825*Cramer's V value = 0.795
Annual income (Rs.)	177.089*Cramer's V value = 0.859
Occupation	94.765*Cramer's V value = 0.889
Type of culture	134.715*Cramer's V value = 0.749
Economic motivation	186.595*Cramer's V value = 0.882
Risk orientation	176.708*Cramer's V value = 0.858
Scientific orientation	153.968*Cramer's V value = 0.801
No. of Training attended	165.043*Cramer's V value = 0.829

*Significant at 0.01 level of probability (2-tailed)

DISCUSSION

The study presents a comprehensive assessment of the training needs among member fish farmers of FFPOs in the study area, revealing the focus areas and the overall level of training requirements. In terms of priority training areas, the highest training need was observed in fish disease management, with emphasis on disease identification and control (mean score $\bar{x} = 3.2$) (Hijam et al., 2015). This finding highlights a critical area where farmers likely face recurrent challenges impacting fish health and yield. Addressing disease management through structured training sessions could equip farmers with the skills needed to recognize and control diseases, ultimately reducing losses and enhancing productivity. Feeding strategy and feed formulation ($\bar{x} = 3.02$) was another significant area of training need. Proper feeding practices are essential for growth and efficiency, directly affecting farm profitability. Training on cost-effective and nutritionally balanced feed formulation could provide farmers with sustainable options to improve growth rates and feed efficiency. Similarly, water quality management ($\bar{x} = 3.0$), another priority area, plays a fundamental role in aquaculture; thus, imparting knowledge on maintaining parameters like dissolved oxygen, pH, and nutrient levels would enable farmers to sustain optimal rearing conditions. Fish breeding techniques ($\bar{x} = 2.67$) and pond construction or renovation ($\bar{x} = 2.65$) were identified as further areas of training need. Breeding techniques are complex and require understanding reproductive cycles and environmental conditions for successful spawning, whereas knowledge of pond design and construction is crucial for creating an ideal environment for fish

growth. These skills could help farmers increase fish stock quality and productivity. Additionally, marketing strategy training ($\bar{x} = 2.61$) is of significant importance. In an increasingly competitive marketplace, equipping farmers with skills in market analysis and product positioning can help them maximize returns and expand their customer base. Furthermore, knowledge about selecting quality seed, determining suitable stocking densities, and choosing appropriate species ($\bar{x} = 2.52$) ensures a balanced ecosystem within ponds, optimizing growth and yield.

Regarding the overall level of training need among the respondents, the study found that a majority expressed a medium level to high level of training need (Hijam et al., 2015; Makwana & Bhatt, 2021; Makwana et al., 2021). By focusing on the priority areas identified, FFPOs and extension agencies can address critical gaps in fish farming skills and knowledge, thereby supporting members in adopting sustainable practices and enhancing productivity in the region. This distribution shows a clear inclination towards private and specialized fisheries institutions for training among FFPO members (Figure 1). Providing targeted training opportunities for FFPO members could significantly enhance their operational efficiency, resilience, and market participation, fostering the long-term sustainability and profitability of fish farming in the region.

Respondents were encountered lot of constraints, where some of constraints were mostly cut down the profit of respondents like high cost of input materials, it can be addressed though more powerful collective bargaining. High disease occurrence with less productivity can be addressed through proper training. So, here proper infrastructure and value chain with significant backward and forward linkages will be recommended (Mondal et al., 2022). The study explores the relationship between the demographic characteristics of FFPO member fish farmers and their training needs, using Cramer's V analysis to reveal significant associations. Among the variables examined, farming experience showed a very strong relationship with training need ($\chi^2 = 199.751$, Cramer's V = 0.912) (Makwana & Bhatt, 2021). Farmers with extensive experience may require more advanced training, focusing on innovations in aquaculture, whereas less experienced farmers might benefit from foundational skills. Those for whom fish farming is the primary occupation likely demand more intensive training, as they are more dependent on maximizing productivity and profitability. The study findings illustrate the importance of considering demographic factors when designing training programs for FFPO members. Customizing training based on variables such as experience, occupation, economic motivation, and education can enhance engagement and effectiveness, ensuring that training programs meet the diverse needs of FFPO members. So, more concerted effort is needed to fulfil the thrust area where the maximum training will be required of fish farmers regarding their farming aspect.

CONCLUSION

Most respondents demonstrated medium to high levels of need, particularly in areas such as disease management, feeding strategies, water quality, and marketing. While farmers have shown a preference for training conducted by private staff, input dealers, and representatives from medicine companies, there is a critical need

for government and extension agencies to strengthen their support. Government efforts should extend beyond financial assistance to include more proactive engagement by field-level staff. Extension services must prioritize a stronger connection between farmers and line departments. The emphasis should be on building farmers' capacity to adopt new technologies effectively and addressing information gaps that hinder sustainable production. Extension service providers should focus on high-priority areas and enhance access to knowledge through innovative methods like dedicated phone-based support for real-time information exchange with experts and effectiveness of training also be measured. More inclined effort should need through line organizations and FFPO body themselves to bridge the knowledge gap.

Acknowledgement

The author is thankful to all resource persons as well as all respondents and also expresses gratitude to the West Bengal University of Animal and Fishery Sciences, which provided the necessary resources and support for conducting this research.

Author's contribution

Conceptualization and designing of the research work (A.H.M., S.S.D.); Execution of field/lab experiments and data collection (A.H.M.); Analysis of data and interpretation (A.H.M., R.K., N.R.); Preparation of manuscript (A.H.M., M.R.S., R.K., N.R.).

REFERENCES

- Dhara, K., Mukherjee, S., Madhu, N. R., & Roy Karmakar, S. (2016). Exotic food fishes in North 24 Parganas district, West Bengal and their ecological assessment. *International Journal of Experimental Research and Review*, 5, 67-73.
- District Controller, Food and Supply, Purba Medinipur, 2022. West Bengal, Memo No. 1310(4)/DCM/Purba/2022.
- Famuwagun, O. S. (2015). *Evaluation of Training Needs of Fish Farmers in Ikorodu Local Government Area of Lagos State*. A Project Report Submitted to the Department of Agricultural Economics and Extension, College of Agricultural Sciences, Landmark University, Omu-Aran, Kwara, Nigeria.
- Goswami, B., & Samajdar, T. (2016). Knowledge of fish growers about fish culture practices. *Indian Research Journal of Extension Education*, 11, 25-30.
- Hijam, B., Pandey, D. K., & De, H. K. (2015). Training need of fish farmers in Bishnupur district of Manipur: an analysis. *Indian Journal of Extension Education*, 51(3&4), 152-155.
- India Brand Equity Foundation (2022). The Fisheries & Aquaculture Sector of India, Accessed from, <https://www.ibef.org/blogs/the-fisheries-aquaculture-sector-of-india>.
- India CSR (Corporate Social Responsibility), 2023. Accessed from, <https://indiacs.in/significance-of-the-fisheries-sector-in-the-indian-economy/>.
- Kumari N., Malik J. S., Arun D. P., & Nain M.S. (2022). Farmer producer organizations (FPOs) for linking farmer to market, *Journal of Extension Systems*, 37(1), 1-6. <http://doi.org/10.48165/jes.2022.38.1.1>
- Lee, D. K. (2016). Alternatives to P value: confidence interval and effect size. *Korean Journal of Anesthesiology*, 69(6), 555.
- Mahanayak, B., & Panigrahi, A. K. (2024). An overview of fishermen cooperatives in West Bengal with special reference to Murshidabad district. In Dr. Somnath Das, Dr. Ashis Kumar Panigrahi, Dr. Rose Stiffin and Dr. Jayata Kumar Das (Eds.), International Academic Publishing House, ISBN: 978-81-969828-9-8; pp. 104-119, DOI: <https://doi.org/10.52756/lbsopf.2024.e01.009>.
- Makwana, R. G., & Bhatt, M. R. (2021). Relationship between the profile of the inland fish farmers and training needs in inland fish farming. *Gujarat Journal of Extension Education*, 32(1), 162-164.
- Makwana, R. G., Bhatt, M. R., Chaudhary, K. L., & Tale, N. N. (2021). Training needs of inland fish farmers in Navsari district of Gujarat. *Journal of Pharmacognosy and Phytochemistry*, 10(3S), 14-16.
- Mallick, A. (2017). Study of Glucose-6 Phosphatase activity in *Clarias batrachus* (Linn.) after feeding the probiotic fish feed. *International Journal of Experimental Research and Review*, 12, 14-23. <https://doi.org/10.52756/ijerr.2017.v12.002>
- Meenambigai, J., & Seetharaman, R. N. (2003). Training needs of extension personnel in communication and transfer of technology. *Agriculture Newsletter*, 48(1), 19.
- Ministry of Fisheries, Animal Husbandry and Dairying (MoFAHD), 2023. Press Information Bureau, Delhi. Accessed from, <https://pib.gov.in/PressReleaseIframePage.aspx?PRID=1924524>.
- Mondal, A. H., Dana, S. S., & Ray, M. (2023). Perceived Effectiveness of Indigenous Technical Knowledge (ITK) among Fish Farmers of FFPO Members: A Study from Purba Medinipur District, West Bengal. *International Journal of Research and Analytical Reviews*, 10(4), 338-352.
- Mondal, A. H., Dana, S. S., Sarkar, M., & Sau, S. (2022). Identification of constraints associated with fish farmers producer organizations (FFPOs) with regard to scientific fish farming. *Indian Journal of Extension Education*, 58(4), 1-8.
- Parthiban Sakthi, R., Nain, M. S., Singh, R., Kumar, S., & Chahal, V. P. (2015). Farmers' producer organisation in reducing transactional costs: a study of Tamil Nadu mango growers' federation. *Indian Journal of Agricultural Science*, 85(10), 1303-1307.
- Pati, T. K. (2022). *Fish Farmer Producer Organizations (FFPO) and its role in increasing productivity*. In: eBook- Minimal Water Exchange Technologies to Develop Aquaculture Entrepreneurship. Chapter 8, pp 55-61
- Rajeev, M., & Bhandarkar, S. (2022). Fisheries Sector in India-An Overview. *Springer Briefs in Economics*, 47-59.
- Rani, P. (2022). Role of Fisheries in Indian Economy – An Mathematical Analysis, *Journal of Emerging Technologies and Innovative Research*, 274-280.
- Saha, G. S., De, H. K., Sahoo, B., Mohanty, S. K., & Rath, D. P. (2023). Fish Farmer Producers Organizations. *Aqua International*, 50-56.
- Singh, A., Singh, R., Nain, M. S., Mishra, J. R., Kumar, P., Sharma, D. K., & Paul, R. K. (2023). Linkage network structures of farmers: analysing FPOs of M.P. and Bihar in India, *Indian Journal of Extension Education*, 59(3), 14-20. <http://doi.org/10.48165/IJEE.2023.59303>
- Uddin, M. N., Ahsan, K., Farouque, M. G., Akter, S., & Rahman, S. (2022). Determinants of training needs of the tilapia (*Oreochromis sp.*) fish farmers: an empirical study from a selected area in Bangladesh. *International Journal of Agricultural Extension*, 10(3), 387-398.