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Measuring KVK-led Fisheries Extension Efforts in Haryana and Punjab: Insights and Interventions

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ABSTRACT

KVKs have proved to be dynamic agents of agricultural development but their role and potential contribution for fisheries development is less known. This study, conducted in 2023, quantifies fisheries extension efforts of all 22 KVKs in Punjab and 19 KVKs in Haryana. The study relied on secondary data sourced from annual reports of ATARI-Ludhiana, ATARI-Jodhpur, ICAR-KVK portal, individual KVK websites as well as primary data collected from KVK-SMS in all districts using a structured online survey, besides field visits to few KVKs. A novel methodology, the KVK-Fisheries Extension Intensity Index (FEII) consisting of 5 dimensions (human resource, infrastructure, budget, fisheries extension activities, and digital outreach), was used to quantify the KVKs' extension effort. The average FEI scores were 33 per cent for Haryana KVKs and 36 per cent for Punjab KVKs with none of the 41 KVKs having *high* FEI (>66%), clearly indicating inadequate attention to fisheries by KVKs. Nearly two-thirds of KVKs in Punjab (68%) and in Haryana (58%) had *moderate* FEI scores. The absence of fisheries SMS and fisheries infrastructure in all, but 5 KVKs in the two states were primary reasons for poor extension effort which needs speedy redressal.

INTRODUCTION

Public extension has been recognised as a crucial element in agriculture development (Babu et al., 2013). Provision of quality extension services has been demonstrated to improve agricultural productivity and farm income (Agholor et al., 2013). Extension services can strengthen the resilience of farmers by improving access to knowledge and inputs (Davis et al., 2014). ICAR has initiated frontline extension approaches namely National Demonstration (1964), Operational Research Project (1974), Krishi Vigyan Kendra (1974), and Lab to Land program (1979) which were clubbed together into KVK system in 1992 (Sahoo et al., 2021). The birth of KVKs itself was a result of ICAR's realisation to integrate research, education, and extension organically within the NARES (Venkatasubramanian et al., 2010). The robust network of district level KVKs, established across the country to refine and disseminate agricultural innovations, helped amplify production and profit through OFTs, FLDs and capacity development at field level (NILERD, 2018; IFPRI, 2019). KVKs provide multidisciplinary and broad-based technological interventions enabling farmers to manage their farms sustainably in an integrated manner (Sinha et al., 2021).

In the crop sector, it is amply documented that KVKs have a significant impact on the economic welfare of farming households and are positively empowered, though the extent of impact is said to vary (IFPRI, 2019; Rani et al., 2021). Many have reasoned that

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the positive impact was the result of enhanced knowledge and skill sets leading to improved technology adoption and income due to KVKs activities (Dubey et al., 2016; Sandhu & Dhaliwal, 2016; Singh & Tanwar, 2020; Kumar et al., 2022). KVKs have proven to be one of the finest solutions for improving knowledge, attitude, and skill level among rural India's farming community (Gorfad et al., 2018). Particularly, KVKs' training and demonstration has played a key role in the adoption-diffusion process due to comprehensive understanding by farmers (Singh et al., 2018). However, the state of know-how on the role and contribution of KVKs in fisheries sector is scanty, as underscored by Subramanniyan (2013); Ananth et al. (2014); Singh & Tanwar (2020); Geetha (2022) & Deboshmita (2022). This is rather surprising in a scenario where fisheries development is considered a sunrise sector with huge untapped growth potential (Takar & Gurjar, 2020; Chrispin et al., 2022). Also, few case studies have demonstrated the potential role of KVKs in strengthening fisheries development at the district level (Deboshmita, 2022; Geetha, 2022). Vast salt-affected areas in Haryana (2.32 lakh ha) and Punjab (1.51 lakh ha) have become unsuitable for crop farming, yet they are prospective resources for both fresh and salt water fish culture (CIFE, 2012; Ansal & Singh, 2019). With a weakened extension system due to half the vacant positions in State Fisheries Departments of Haryana (55%) and Punjab (56%), importance of KVKs as source of do-how and know-how in districts for fisheries development gains traction. Thus, this study was undertaken to assess the present state of fisheries extension activities by KVKs in Haryana and Punjab, and identify gaps to further strengthen and upscale their efforts.

METHODOLOGY

The inland states of Haryana and Punjab were selected due to their vast untapped potential for inland saline aquaculture, and the paucity of studies on fisheries extension. During 2019-20, Punjab and Haryana produced 1.51 and 1.91 lakh tonnes of fish respectively (Handbook of Fisheries Statistics, 2020). Punjab has 23 districts with 22 KVKs and Haryana has 22 districts with 18 KVKs as per ICAR-KVK Portal. Besides, the state funded KVKs in Palwal, Karnal, Panchkula and Nuh districts in Haryana have not been included in the ICAR directory. KVKs of Haryana come under the jurisdiction of ATARI- Jodhpur and Punjab KVKs come under ATARI-Ludhiana.

The study uses the novel methodological framework, KVK-Fisheries Extension Intensity Index (FEII), inspired from the widely used project management tool Logical Framework Analysis, that has been adapted and validated in the context of assessing KVKs extension efforts in West Bengal, Bihar, Andhra Pradesh, and Tamil Nadu (Deboshmita, 2022; Geetha, 2022; Ananthan et al., 2021). FEII uses the inputs-outputs-outcomes framework and a set of measurable indicators to assess the *inputs* (human resource, working environment, infrastructure and budget) that fuels KVK activities as well as *outputs* (OFTs, FLDs, Trainings and digital outreach) of KVKs, while leaving out outcomes and impact that becomes discernible in the medium and long term. KVK-FEII consists of 5 dimensions with differential weights namely human resource (30%), infrastructure (15%), budget (10%), fisheries extension activities (35%) and digital outreach (10%).

The study covered 41 of 44 KVKs (22 in Punjab and 19 in Haryana) present and functional as of December 2022 in the two states. Relevant secondary data available from annual reports of both ATARIs, ICAR-KVK portal, websites of individual KVKs were compiled and tabulated. Primary data was collected from KVK-SMS representing all the districts through a structured online survey. Google Forms were sent to all the KVK-SMS through respective ATARIs and responses were received from 48 SMS (54.4%) in Haryana and 55 SMS (47%) in Punjab. The primary responses were obtained on a 3-point Likert scale. At least one response from each of the KVK was ensured as the FEII was calculated for each KVK. The responses were coded and analysed using descriptive as well as inferential statistical tools. The first author also visited a few KVKs in each state to gain a first-hand understanding of KVKs' activities. To get the FEII scores, the responses of SMS belonging to the same KVK, if more than one, were pooled and considered as a single response. Arc-GIS software was used to generate spatial maps for each state representing district wise KVK-FEII scores.

RESULTS AND DISCUSSION

Profile of KVKs

First KVK in Haryana was established in 1976 in district Karnal under ICAR-NDRI, while in Punjab, the first KVK was established in district Gurdaspur in 1982. Majority of KVKs in Haryana (36%) were established during 1985-1994 and in Punjab (45%) during 2005-2014. With the Prime Minister's announcement in 2015 that there should be atleast one KVK in each district, considerable progress has been achieved (Figure 1).

In Haryana, there are 22 districts and 22 KVKs, 18 KVKs are ICAR funded and 4 are state funded. The four-state funded KVKs are in Palwal, Karnal, Panchkula and Nuh district. Karnal has 2 KVKs one under State Agricultural University (SAU) and other under ICAR-NDRI Karnal. One district, Charkhi Dadri doesn't have a KVK yet as it was carved out from Bhiwani district in 2016. Out of 22 KVKs, majority (82%) of them in Haryana are under the SAU (Chaudhary Charan Singh Haryana

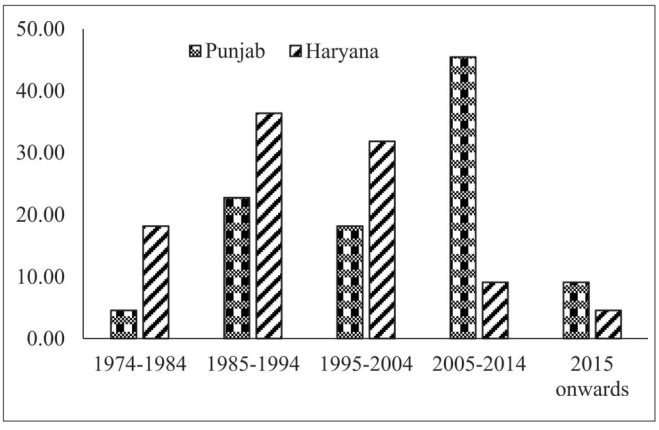

Figure 1. Year of Establishment of KVKs

Agricultural University, Hisar), 9 per cent under ICAR institutes (IARI and NDRI) and 9 per cent under NGOs (Bhagwat Bhakti Ashram, Rampura, and Society for Creation of Heaven on Earth).

In Punjab out of 23 districts, only one district doesn't have a KVK (Malerkotla, carved out from Sangrur district in 2021). Except one KVK which is under ICAR-Central Institute of Post-Harvest Engineering & Technology, rest of them (95.5%) are under the two SAUs (Punjab Agriculture University, and GADVASU, Ludhiana). This is a skewed distribution as compared to most states and the country as well wherein about 50-60% KVKs are under the SAUs and the rest are under either ICAR institutes or the NGOs (Deboshmita, 2022).

Infrastructure facilities and human resource status

KVKs are expected to have adequate infrastructure and physical facilities for accomplishing their mandated activities. Except for a few KVKs, most of them have basic infrastructure namely administrative building, farmers' hostel, staff quarters, vehicles, and soil water testing lab. However, it was found that only 2 KVKs (10.52%) in Haryana and 3 KVKs in Punjab (13.63%) have fisheries related infrastructure. Pennobaliswamy et al. (2018) suggested that development of physical facilities will help in promoting extension work and sustainable development in agriculture and allied sectors.

The accomplishment of KVKs mandated activities is greatly determined by the deployed human resource. The staff strength sanctioned to each KVK is 16, which includes 1 senior scientist and Head (Programme Coordinator), 6 Subject Matter Specialists (SMS), 1 Farm Manager, 3 Programme Assistants, 2 Administrative staff, 2 Drivers and 2 Supporting Staff. Regular capacity building of KVK professionals is crucial to increase the vibrancy and visibility of the KVK system. It was found that only 204 (67%) were in position out of sanctioned 304 staff in 19 KVKs of Haryana. Staff position in Punjab KVKs was much better with only 20 per cent vacancy i.e., 282 out of 352 were in position in 22 KVKs. SMS are the key resource persons in KVKs for carrying out effective extension services. It was observed that 26 (22.81%) of SMS posts were vacant in Haryana and 15 (11.36%) posts were vacant in Punjab, considerably better compared to other staff. SMS vacancies were more in the districts of Fazilka (6), Hisar (4), Panipat (4) and Kaithal (4). Mukherjee and Maity (2015) argued that in India large numbers of positions in the public extension system are vacant, resulting in overload for extension personnel and thus, lowering their efficiency. More alarmingly, only two KVKs (10.5%) in Haryana i.e., Karnal and Panchkula have Fisheries SMS in position, and only three KVKs (13.6%) in Punjab i.e., Tarn Taran, Barnala and Mohali (SAS Nagar) have Fisheries SMS. Bashir et al., (2016) reported that only about 5 per cent of the SMS working in KVKs in Tamil Nadu and Kerala have specialization in fisheries. Only 17 per cent of KVKs in Andhra Pradesh and 13% of KVKs in Tamil Nadu reported fisheries related extension activities which was attributed to the presence of fisheries SMS (Geetha, 2022). This highlights the importance of fisheries SMS in districts with high fisheries potential.

Budget and digital outreach

Budgetary provisions, especially operational budget, are the lifeline for KVKs. ATARIs provide this based on an assessment of the budgetary demands. A novel revolving fund facility is available for KVKs which gives them much needed operational flexibility. ICAR/Host Institute provides one-time seed money to each KVK, which is supplemented by income earned by the KVKs through sale of farm produce and services provision. A substantial amount of revenue generated by KVKs is available for spending / reinvestment in order to generate further revenue and recoup costs. About 16 KVKs in Haryana and 17 KVKs in Punjab have revolving funds of more than Rs. 20 lakhs, indicating a healthy fiscal scenario and giving a leverage to carry out need based extension activities.

In the era of digital and information revolution, the public extension providers are expected to have an informative website as a minimum. The presence and adequacy of KVKs individual websites were assessed for all the KVKs in both states. The specific indicators were availability of individual websites, website in state language, information on staff contact, infrastructure available, training and extension activities, and regular updation. It was observed that though 95 per cent of KVKs in Haryana have their own website, none of them were in Hindi. On the other hand, 63 per cent KVKs in Punjab have their own websites and 41 per cent of websites were in Punjabi as well. About 84 per cent of KVK websites in Haryana and 59 per cent KVK websites in Punjab had information about their respective training and extension activities. Updation was found to be very poor especially in Haryana with only 11 per cent of KVKs and 45.4 per cent in Punjab updating regularly. Deboshmita (2022) also reported that most of the KVKs in West Bengal and Bihar don't update their websites regularly.

Fisheries extension activities

Under this dimension, KVKs were assessed with regard to conduct (type and number) of OFTs, FLDs, training related to fisheries, and organization of fisheries related exhibitions/farmers meet. Besides, they were also assessed for availability and development of technical / extension literature related to fisheries. The average Fisheries Extension activities scores were found to be very low: an average of 3.48 out of 35 in Haryana and 5.59 in Punjab. FLDs, OFTs and training related to fisheries were conducted by only those KVKs in which fisheries SMS were in position in both states. The low scores indicate that KVKs are not focusing on fisheries at present. Absence of fisheries SMS and or related infrastructure in the KVKs are found to be primary reasons. Studies by Deboshmita (2022) & Geetha (2022) also present a similar portrait. In contrast, KVK of Ernakulam district in Kerala which is under the jurisdiction of ICAR-Central Marine Fisheries Research Institute has played a crucial role in standardising the shrimp farming and popularizing it in the district (Subramanniyan, 2013).

FEII scores of KVKs in Haryana and Punjab

Table 1 highlights district wise scores for different dimensions of FEII. Panchkula (19.06) followed by Karnal (17.71) and Sirsa

Table 1. Fisheries extension intensity index scores for districts in Haryana (n=19)

Districts	Human resource (30)	Infrastructure (15)	Budget (10)	Fisheries extension activities (35)	Social media (10)	Total score (100)
Karnal	17.71	9.00	7.00	7.33	7.67	48.71
Sirsa	15.88	8.00	6.00	3.75	7.00	40.63
Jhajjar	10.56	13.00	6.00	4.50	6.00	40.06
Panchkula	19.06	6.00	1.50	5.81	5.75	38.12
Sonipat	12.40	8.00	7.00	2.00	6.50	35.90
Yamunanagar	11.17	6.00	6.50	5.74	5.00	34.40
Rewari	9.09	8.00	5.67	4.90	6.60	34.26
Mahendragarh	11.44	8.00	6.50	2.56	5.75	34.25
Faridabad	13.08	6.00	6.00	2.08	7.00	34.16
Rohtak	11.16	6.00	6.80	5.45	4.67	34.08
Kurukshetra	8.48	8.00	7.00	4.25	6.00	33.73
Panipat	7.50	8.00	6.80	3.80	6.00	32.10
Fatehabad	10.21	6.00	7.00	0.00	6.00	29.21
Kaithal	6.38	8.00	5.33	3.00	5.67	28.38
Gurgaon	9.02	8.00	5.00	4.75	1.33	28.10
Bhiwani	7.98	8.00	5.67	1.17	3.67	26.48
Ambala	11.65	6.00	2.00	2.50	3.50	25.65
Hisar	4.46	8.00	6.00	2.50	4.17	25.13
Jind	6.58	8.00	5.00	0.00	1.50	21.08
Average	10.73	7.68	5.72	3.48	5.25	32.86

Table 2. Fisheries extension intensity index scores for districts in Punjab (n=22)

Districts	Human resource (30)	Infrastructure (15)	Budget (10)	Fisheries extension activities (35)	Social media (10)	Total score (100)
Barnala	17.08	6.00	9.00	29.50	2.00	63.58
Tarn Taran	13.71	6.50	2.50	24.75	9.00	56.46
Hoshiarpur	12.71	8.00	10.00	5.75	8.00	44.46
Ludhiana	11.63	7.50	10.00	2.97	8.25	40.35
Ropar	12.94	7.00	10.00	1.25	8.50	39.69
Moga	14.44	7.50	8.75	5.25	3.50	39.44
Jalandhar	13.04	7.50	8.75	4.87	4.50	38.66
Faridkot	15.02	8.00	9.17	4.17	2.00	38.36
Sangrur	8.29	11.00	7.50	4.17	7.00	37.96
Muktsar	12.88	6.50	10.00	2.25	5.50	37.13
Patiala	12.47	7.50	9.17	3.08	4.33	36.56
Ferozepur	12.75	7.50	10.00	0.50	5.00	35.75
Bathinda	10.81	7.50	8.12	2.63	6.00	35.07
Mohali	16.94	3.50	3.50	10.25	0.00	34.19
Amritsar	11.54	5.50	7.50	1.75	7.5	33.80
Kapurthala	12.94	10.00	5.00	2.00	2.00	31.94
Gurdaspur	13.61	7.00	8.33	0.56	1.33	30.83
Nawanshahar	8.88	7.50	5.00	1.50	7.50	30.38
Fatehgarh Sahib	9.34	6.50	6.00	1.87	4.80	28.51
Mansa	10.15	5.50	6.87	3.06	1.75	27.33
Fazilka	6.00	4.00	5.00	7.00	2.00	24.00
Pathankot	8.33	3.00	0.83	3.75	0.67	16.59
Average	12.07	6.84	7.32	5.59	4.60	36.41

(15.00) scored high for human resource and working environment dimension. This was due to the presence of fisheries SMS. Jhajjar scored higher for infrastructure dimension, which may be attributed to presence of fisheries demo units along with other basic infrastructure. The scores of different district KVKs were found to be in the range of 5-7 except for Panchkula (1.50) and Ambala (2.00), where the scores were found to be low. The lower score for Ambala KVK may be attributed to its host institute's (NGO) interest. Most of the KVKs scored low for fisheries extension activities dimension, attributed to a large extent to the lack of fisheries SMS and fisheries related infrastructure. Surprisingly, KVK Gurgaon (1.33) which is under ICAR-IARI, and KVK Jind

(1.50) obtained lowest scores for social media usage indicator. About 59 per cent of KVKs obtained a medium score of FEII, the rest had low scores. The FEII score for Karnal was highest 48.47, this can be due to the presence of fisheries SMS and availability of fisheries related infrastructure. None of the KVKs in Haryana scored high for FEI, thus indicating the need to support them for intensifying fisheries development efforts. Thus, it could be concluded that for Haryana the very low average scores for human capital (10.73), fisheries extension activities (3.48) and social media (5.25) dimensions led to poor overall FEII score (32.86). Geetha (2022) reported that the average FEII score for Tamil Nadu KVKs was 39.2 per cent and for Andhra Pradesh KVKs was 33.7 per cent which compares with Haryana. This only underscores the overall dismal scenario of KVK-led fisheries extension at present in most states, with the exception of states like West Bengal that have a moderately high FEII score of 48.76.

Table 2 highlights district wise scores for different dimensions of FEII. Barnala (17.08) followed by Mohali (SAS Nagar) (16.94) and Faridkot (15.02) scored high for human resource and working environment dimension. Sangrur scored the highest (11) for infrastructure dimension. The score of budget dimension was found to be low for Pathankot (0.83), Tarn Taran (2.50) and Mohali (SAS Nagar) (3.50). Except Barnala (29.50) and Tarn Taran (24.75), other KVKs scored low for fisheries extension activities, due to the lack of Fisheries SMS and fisheries related infrastructure. KVK Mohali (0), Mansa (1.75), Barnala (2) and Faridkot (2) scored very poorly on social media indicators. About 68 per cent of KVKs have a medium score of FEII, the rest have low scores. The FEII score for Barnala was highest (63.58) as a result of fisheries SMS and fisheries related infrastructure in the KVK that has led to noticeable extension activities. None of the KVKs in Punjab scored high (>66) on FEII, indicating the need to redress the existing gap to intensify fisheries development efforts. Again, it could be seen that the average scores for human resource (12.07), fisheries extension activities (6.84) and social media (4.60) dimensions were low leading to lower FEII score (36.41) in Punjab. Deboshmita (2022) reported that the average FEII score of KVKs in Bihar was 36.78 per cent, almost similar to Punjab, Haryana, Tamil Nadu, and Andhra Pradesh.

CONCLUSION

The evidence, in the form of poor KVK-FEII scores for both states and for the majority of KVKs, clearly demonstrates that fisheries has not yet become one of the priority areas of KVKs. This calls for reconsidering the cadre strength of KVKs by appointing fisheries SMS in identified districts with considerable fisheries potential, besides making immediate steps to fill vacant SMS positions. In districts with full strength of SMS, animal science or agricultural extension SMS may be trained to conduct fisheries extension activities as an interim measure. Fisheries demonstration units should be created in districts with high fisheries potential and adequate budgets should be provided for the same. A one-time catch-up grant for revamping each KVK website, making it bilingual and building the capacity of SMS and other KVK staff in effective social media usage will provide a visible impetus to usher in a KVK-led fisheries development in the state.

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