



Adoption Constraints of KVK Interventions Among Small Tribal Farmers: Challenges and Strategic Solutions

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(Received: 05 April 2025; Revised: 16 May 2025; Accepted: 14 June 2025; Published online: 03 July 2025)

(Published by Research Trend)

ABSTRACT: Krishi Vigyan Kendras (KVKs), as grassroots-level institutions, play a vital role in enhancing the knowledge and skills of rural populations through targeted training programs. Recognizing the significance of such interventions, the present study was conducted during 2023–24 to examine the constraints encountered by tribal farmers in adopting the recommended practices introduced by KVKs operating in the tribal districts of Madhya Pradesh. A total of 240 tribal farmers comprising 120 beneficiaries and 120 non-beneficiaries were randomly selected from 12 villages of the Chhindwara and similarly 12 villages of the Betul districts for the study. The findings indicated that the most prominent constraints faced by tribal farmers included the Poor information link and sharing with other actors of the network, Lack of influence of extension services and social learning, insufficient and untimely demonstrations, and Unavailability of necessary information associated with new technologies.

Keywords: Adoption, beneficiaries, constraints, Krishi Vigyan Kendra (KVK).

INTRODUCTION

The utilization of modern inputs and the adoption of improved agricultural technologies are widely acknowledged as critical drivers of enhanced productivity. Empirical research has consistently demonstrated that the adoption of recommended production practices leads to increased yields and, subsequently, higher income for farmers. However, the extent to which farmers adopt these technologies is influenced by a range of factors, including various constraints they encounter. In this context, *constraints* are defined as challenges or limitations that hinder the adoption and effective utilization of improved practices or innovations (Kumari *et al.*, 2020).

The Krishi Vigyan Kendra (KVK) initiative, under the aegis of the Indian Council of Agricultural Research (ICAR), serves as a key institutional mechanism for testing and transferring agricultural technologies. It

aims to bridge the gap between production potential and actual farm productivity, while also promoting self-employment among rural communities (Bhattacharyya *et al.*, 2021). The training programs offered by KVKs adhere to experiential learning principles such as “learning by doing” and “seeing is believing,” and they are designed to be both knowledge- and skill-oriented across multidisciplinary domains (Singh *et al.*, 2023). KVKs act as knowledge hubs for the farming communities in their respective regions and operate through collaborative efforts involving scientists, subject matter specialists, extension personnel, and farmers (Devi *et al.*, 2023).

Tribal communities make substantial contributions to local and national economies by engaging in a variety of income-generating activities (IGAs), including vegetable cultivation, nursery management, livestock and poultry farming, cottage industries, and small-scale enterprises. Despite their potential, tribal populations

often remain disconnected from modern agricultural advancements and continue to be marginalized from mainstream economic development (Harshavardhan *et al.*, 2021). In the state of Madhya Pradesh, 47 KVKs operate under Zone VII of the Zonal Project Directorate (ZPD), with six specifically serving tribal districts. These KVKs concentrate on the dissemination of location-specific agricultural technologies and the facilitation of information access to support the socio-economic empowerment of tribal populations (Sahoo *et al.*, 2021).

Given the importance of agriculture as the cornerstone of the tribal economy, there is a concerted effort to enhance agricultural productivity in tribal areas through targeted interventions (Harshavardhan *et al.*, 2021). In this regard, *constraints* are understood as factors or conditions that impede the effective adoption of improved agricultural practices, resulting in suboptimal resource utilization and lower productivity (Bhatnagar *et al.*, 2018).

Considering these considerations, the present study, was undertaken with the primary objective of identifying the key constraints faced by tribal farmers in embracing and implementing recommended agricultural interventions.

Research Gap. While several studies have explored the general impact of Krishi Vigyan Kendra (KVK) interventions on agricultural productivity, **there remains a significant research gap in understanding the context-specific constraints faced by small landholding tribal farmers in adopting these interventions—particularly how socio-cultural, ecological, and institutional factors interact to hinder effective adoption.** Furthermore, limited empirical evidence exists on the *differentiated constraints between beneficiaries and non-beneficiaries*, and how tailored, participatory extension strategies could address these disparities for sustainable adoption.

Importance of the study. This study aims to understanding the constraints perceived by respondents in adopting the recommended intervention practices provided by Krishi Vigyan Kendras (KVKs) is crucial for bridging the gap between agricultural research and field-level application. Identifying and analyzing these barriers is essential to redesign extension strategies, customize training modules, and ensure that technological innovations are contextually relevant and practically feasible for tribal farmers. The findings of this study can contribute to policy formulation, enhance

the effectiveness of KVKs, and ultimately promote inclusive and sustainable agricultural development in tribal regions.

METHODOLOGY

The study was carried out in the Krishi Vigyan Kendras (KVKs) located in the Satpura Plateau region of Madhya Pradesh, which includes the districts of Chhindwara and Betul during 2023-24, falling under the jurisdiction of Jawaharlal Nehru Krishi Vishwa Vidyalaya (JNKVV), Jabalpur. These two districts are characterized by a high concentration of tribal populations. Two blocks were selected from each district, with one representing a predominantly tribal population and the other a non-tribal population. In Chhindwara district, Tamia block was selected as the tribal block, while Mohkhed served as the non-tribal block. Likewise, in Betul district, Ghodadongri was identified as the tribal block and Prabhatpattan as the non-tribal block. Three villages from each block were purposively selected based on their adoption by the Krishi Vigyan Kendra for implementing its mandated activities. Hence the selected villages were Sidholi, Geldhubba and Beejadhana were selected from Tamia block, Adhwar, Ikkalbihari and Badnur from Mohkhed block in Chhindwara district similarly Ranipur, Hirawadhi and Dudhawani from Ghodadongri block and Charsi, Savangi and Hiwarkhed from Prabhatpattan block under Betul district. Thus, a total of 12 villages were included in the study. A comprehensive list of farmers from each selected village was compiled with assistance from KVK officials. From this list, 20 farmers (comprising 10 beneficiaries and 10 non-beneficiaries) were randomly selected from each village. Consequently, the total sample size for the study was 240 farmers.

RESULTS AND DISCUSSION

Socio-personal and cultural barriers hindering the adoption of Krishi Vigyan Kendra (KVK) interventions refer to the challenges arising from individual knowledge gaps, cultural norms, and resource limitations that restrict farmers' ability to effectively adopt and implement modern agricultural technologies and practices introduced by KVKs. These barriers can be measured through technical knowledge, resource availability, cultural compatibility, educational attainment, and perceived complexity of new technologies.

Table 1: Distribution of the respondents according to their socio-personal and cultural barriers (n=240).

Constraints	Mean score	Rank
Lack of adequate technical knowledge about new technologies	1.98	I
Difficulty of integrating new technologies into the existing farming system	1.82	IV
Low literacy and educational level	1.94	II
Environmental barriers against using new technologies	1.71	VII
Inadequate financial resources	1.92	III
High cost of using new technologies	1.77	VI
Cultural belief and traditional practices	1.81	V

Among the enlisted constraints relating to socio-personal and cultural aspects in Table 1, lack of adequate technical knowledge about new technologies was the most severe constraint as perceived by the respondent, so it was ranked first with a mean score of 1.98 followed by the low literacy and educational level (mean score=1.94), inadequate financial resources (mean score=1.92), difficulty of integrating new technologies into the existing farming system (mean score=1.82), cultural belief and traditional practices (mean score=1.81), high cost of using new technologies (mean score=1.77), and environmental barriers against using new technologies (mean score =1.71). The above findings are supported by Rajan *et al.* (2014).

Barriers associated with the information network influencing tribal farmers' adoption of new or improved technology refer to the challenges related to the accessibility, availability, and reliability of information channels that hinder the effective dissemination and understanding of agricultural innovations among tribal farmers. These barriers can be measured through limited access to extension services, lack of participation in farmer networks, low digital literacy, and inadequate communication infrastructure.

Table 2: Distribution of the respondents according to their barriers associated with Information Network (n=240).

Constraints	Mean score	Rank
Weak institutional linkage	1.93	II
Lack of tailored technologies	1.81	IV
Limited access to information and communication	1.78	V
Lack of trust in available information and information sources	1.76	VI
Poor infrastructure and connectivity	1.94	I
Irregular extension contact and follow-up	1.87	III

Among the enlisted constraints relating to information network aspects in Table 2, Poor infrastructure and connectivity was the most severe constraint as perceived by the respondent, so it was ranked first with a mean score of 1.94 followed by Weak institutional linkage (mean score=1.93), Irregular extension contact and follow up (mean score=1.87), Lack of tailored technologies (mean score=1.81), Limited access to information and communication (mean score=1.78), and Lack of trust on available information and information sources (mean score=1.76). The above findings is supported with findings of Yadav *et al.* (2020).

Table 3: Distribution of the respondents according to their actionable recommendations to enhance their engagement with KVK initiatives (n=240).

Sr. No.	Recommendations	Frequency	Percentage	Rank
1.	Organize regular on-farm demonstrations and field days to showcase successful technology adoption	156	65.00	IV
2.	Encourage participatory technology development where farmers are involved in trials	164	68.33	III
3.	Facilitate linkage with financial institutions for access to credit and subsidies	200	83.33	I
4.	Introduce low-cost technological alternatives and phased adoption models	168	70.00	II
5.	Ensure alignment of new practices with existing cultural beliefs where possible	131	54.58	VI
6.	Provide continued on-field support post-training to assist with practical challenges	145	60.42	V
7.	Develop mobile-based advisory platforms for real-time information dissemination	110	45.83	VII

The respondents proposed various recommendations to address the constraints they faced, which were ranked in order of significance based on the frequency and percentage of responses, as presented in Table 3. Among the total respondents, 83.33 per cent recommended facilitating linkages with financial institutions to improve access to credit and subsidies. This was followed by the suggestion to introduce low-cost technological alternatives and phased adoption models (70.00%), and the encouragement of participatory technology development by involving farmers in field trials (68.33%). Additionally, 65.00 per cent of respondents emphasized the need to organize regular on-farm demonstrations and field days to showcase successful technology adoption. Continued on-field support after training to assist with practical challenges was recommended by 60.42 per cent of respondents. Furthermore, 54.58 per cent suggested

ensuring that new practices align, where possible, with existing cultural beliefs to improve acceptance, while 45.83 per cent advocated for the development of mobile-based advisory platforms to enable real-time information dissemination.

CONCLUSIONS

On the basis of above study, it may be concluded that poor information connections and weak communication among key players, especially between KVKs and tribal farmers, are the biggest obstacles to effective information networks in tribal areas. Other major barriers include limited extension influence, a lack of timely and relevant information, insufficient technical training, and low trust in available information sources. To tackle these issues, respondents strongly stressed the need for better connections between institutions, particularly with financial institutions. They also called

for the promotion of low-cost technologies, participatory methods, and regular on-farm demonstrations. Continued support after training, cultural fitting of new practices, and using mobile-based advisory platforms were also suggested as key strategies to improve the flow and use of agricultural information. Overall, these insights indicate that a more connected, culturally aware, and participatory extension approach is essential for increasing technology adoption and agricultural growth in tribal regions.

Acknowledgement. I would like to express my sincere gratitude to my guide, institution and all the individuals for their contribution and support to made this research possible.

Conflict of Interest. None.

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How to cite this article: Sundarlal Alawa, Seema Naberia, S.R.K. Singh, R.S. Raghuvanshi, Umesh Singh, Sarita Singh, Ashutosh Singh Rajpoot and Arpit Somtiya (2025). Adoption Constraints of KVK Interventions Among Small Tribal Farmers: Challenges and Strategic Solutions. *Biological Forum*, 17(7): 01-04.