

Attitudes of Farm Outreach Professionals Toward the Use of Electronic Advisory Services in Punjab, Pakistan

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Abstract

This study attempted to examine the attitudes of agricultural extension agents, in this research termed Farm Outreach Professionals (FOPs), towards the use of electronic extension methods in five districts selected from Punjab, as well as the difficulties they face in applying these methods. The study also investigated how independent variables influenced the strength of these judgements. The sample includes around 86% of the 160 agricultural extension agents in the study population, with 138 having completed the questionnaires and met the research requirements. According to the findings, 64% of Punjab's agricultural extension agents had a positive attitude towards electronic agricultural extension approaches, while only 18% had a negative or indifferent one. The study also examined how independent variables influenced the strength of these judgements. The sample includes 180 Farm Outreach Professionals in the study population, with 160 of them completing questionnaires and meeting research requirements. According to the findings, 64% of Punjab's agricultural extension agents/FOPs had a positive attitude towards electronic agricultural extension approaches, while only 18% had a negative or indifferent one. The most significant impediments discovered were a lack of seriousness in applying these approaches and a lack of follow-up by agricultural extension agents on websites dedicated to electronic extension methods. The dependent variable was extension agents' attitudes towards electronic agricultural extension services, and the independent variables were "educational level," access to training in agricultural extension techniques, and the availability of electronic devices for extension agents, which were found to be significantly positively correlated at the 0.01 level.

At the 0.01 level, there was a significant negative correlation between the dependent variable (extension attitudes) and the independent variable (age).

Keywords: Farm Outreach Professionals, Electronic Advisory Services, Agriculture Extension Approach, Punjab

Introduction

The agricultural industry has made significant advances in a variety of technical disciplines, owing to the ongoing evolution of ideas, knowledge, and current agricultural inventions. However, the creation of new technology alone does not guarantee meaningful improvement unless it is backed with effective and innovative extension strategies. The success of agricultural innovation is heavily dependent on how effectively these innovations are distributed, simplified, and explained to farmers, assuring their practical adoption and implementation (Qamar, 2000). According to research, current extension strategies significantly improve farmers' learning and decision-making processes. Smartphone applications, agricultural outreach organizations, and knowledgeable innovative farmers are some of the most prevalent sources for agricultural information, and all of which play important roles in knowledge transfer (Kassem *et al.*, (2021), Khan (2024). The efficacy of agricultural extension programs is mostly determined by the competency and efficiency of Farm Outreach Professionals, who act as the primary connection amongst rural populations and the most recent agricultural innovations. These industry experts work directly with farmers, enabling them to embrace new techniques and best practices. Outreach practitioners' levels of training, technical expertise, knowledge, and communication skills have a significant impact on the general effectiveness of the service they provide. Furthermore, the accessibility and proper application of sophisticated extension methodologies improves the efficiency of agricultural extension initiatives by meeting the educational needs of both FOPs and farmers (Al-Nassar *et al.*, 2003). In countries whose agriculture is the backbone of the economy, such as Pakistan, conventional agricultural extension practices have long been the foundation of farmer participation. These methods often include a mix of individual and group communication initiatives aimed at providing farmers with critical information and support. Extension personnel frequently visit farms, hold workshops, and organize community gatherings to give information on best practices, crop management, pest control, and sustainable agricultural methods (Khan *et al.*, (2024). This hands-on approach has helped farmers increase output and adapt to changing agricultural conditions. However, recent studies show that farmers' access to agricultural information has changed significantly, especially in nations like Pakistan. Kassem *et al.* (2021) claim that smartphone applications have risen above conventional approaches along with extension organizations as farmers' primary source of information concerning agriculture. Although agriculturalists widely rely on their cellphones for rapid updates, professional guidance, and marketplace data, this trend highlights the growing significance of digital technology in the agricultural industry. Mobile apps' ease of access and use put vital information in farmers' grasp, facilitating prompt and well-informed decision-making (Khan *et al.*, 2024) Electronic extension techniques have emerged as a game-changing tactic to improve the spread of agricultural information even more. These techniques make use of contemporary technology, such as computers, the Internet, and other electronic mediums, to enable the efficient dissemination of agricultural knowledge. Extension services can reach more people and help them in an immediate manner, no matter where they are in the world, by using these resources. In addition to streamlining communication, this digital strategy strengthens linkages connecting rural farmers, extension services, and agricultural research facilities. An important development in agricultural communication is the incorporation of electronic extension techniques, as Singh *et al.* (2015) point

out. These creative approaches make it possible to share new technology, best practices, and research findings more effectively and interestingly. Electronic extension approaches help to improve agricultural productivity and sustainability by facilitating interaction among ranchers and researchers. Adopting these contemporary communication technologies will be essential for empowering farmers and improving food security in economies reliant on agriculture as the agricultural environment changes (Khan *et al.*, 2024). In the field of agricultural extension services, electronic extension methods are essential for overcoming staffing shortages and removing geographic barriers. These technologies enable extension agents to reach a wider audience and give farmers prompt help and responses by facilitating interactive learning experiences and real-time contact. An increasingly flexible and responsive agricultural extension system is the outcome of online platforms' promotion of interactive contact between extension agents, scholars, and rural communities (El-Gamal 2013). Incorporating these contemporary approaches is essential to guaranteeing that farmers stay knowledgeable, capable, and prepared to adopt innovative farming techniques, so supporting the long-term growth of the agricultural industry. Through its several agricultural extension bureaus, Pakistan's Ministry of National Food Security & Research (MNFSR) has acknowledged the value of incorporating electronic extension techniques into its outreach initiatives (MNFSR, 2022). Boosting dissemination of information, promoting farmer interaction, and guaranteeing the timely delivery of novel agricultural methods are the goals of using digital platforms in agricultural extension services. Extension organizations can effectively convey new concepts, methodologies, and research findings to farmers by utilizing electronic extension approaches. This allows them to have direct access to agricultural specialists and support services without the need for in-person visits. In order to facilitate contact between farmers and extension experts, the government has introduced a number of mobile applications and digital platforms. The Kisan Call Centre is one such program that uses hotline services to offer farmers throughout Pakistan professional advice on a range of agricultural matters (Pakistan Telecommunication Authority, 2021). Similar to this, the Punjab Agriculture Department's AgriSmart mobile application helps farmers make better decisions by providing them with real-time weather updates, pest control advice, and market price data (Punjab Agriculture Department, 2023). The necessity to evaluate Farm Outreach Professionals' attitudes towards these contemporary techniques is highlighted by Pakistan's growing reliance on electronic extension services. Thus, the current study aimed to assess how Farm Outreach Professionals (FOPs), perceive the use of digital extension tools, the difficulties they face, and the possible influence of electronic extension techniques on Pakistani agricultural advisory services.

Materials and Methods

This study focused on 160 extension agents working in agriculture from different districts, tehsils, and rural areas in Punjab, Pakistan, who are connected to the Ministry of Agriculture (Extension, Research, and Related Departments) government. Approximately 160 FOPs, or 88% of the total questionnaire distributed (180) out of population, responded to an electronic questionnaire that was provided to them in order to gather data. The questionnaire's reliability was evaluated using Cronbach's Alpha coefficient, which produced a value of 0.81, indicating strong internal consistency, and its validity was confirmed by specialists in agricultural extension and rural development. The completed survey was made accessible via an online agricultural advising portal that links all agricultural extension agents across the country. A variety of quantitative methods, such as frequency distributions, percentages, arithmetic means, standard deviations, and Spearman's rank correlation coefficient, were then used to statistically analyze the gathered replies. The Statistical Package for the Social Sciences (SPSS) program was used for all studies in order to look at how variables related to one another and come to insightful conclusions.

Results and Discussion

Table 1: Demographic Characteristics of Respondents

Demographic Variable	Category	Frequency (N=160)	Percentage (%)
Age group (years)	Less than 35	27	16.8
	35 – 47	92	57.5
	47 and above	50	31.3
Educational qualification	Diploma	57	35.3
	Bachelor's Degree	86	53.8
	Postgraduate Degree	21	13.2
Training in modern extension methods	No Training	76	47.2
	Received Training	84	52.8
Experience (years)	Less than 5	18	11.5
	5 – 10	84	52.0
	More than 10	58	36.5
Ownership of electronic devices	Yes	85	53.4
	No	57	35.7
	Not Interested	18	10.9

The main demographic traits of the respondents are succinctly summarized in this table. According to the statistics in Table 1, 57.5% of the respondents were between the ages of 35 and less than 48, 16.8% were younger than 35, and 31.3% were older than 47. In terms of educational background, almost 50% of the participants had earned a bachelor's degree in a field related to agriculture. Furthermore, 35.3% possessed diploma credentials, while 13.2% had studied higher education and earned postgraduate degrees. When asked if they had received any training in modern extension techniques, 52.8% of agricultural extension agents said they had, while 47.2% said they had not. Regarding work experience, more than half of the participants had five to ten years of experience, followed by more than ten years (36.5%) and less than five years (11.5%). Of those surveyed, 53.4% said they had access to electronic gadgets, whilst 35.7% said they did not. Furthermore, 10.9% of respondents said they had little interest in delivering extension services via electronic devices.

Attitudes of Agricultural Extension Agents Regarding Electronic Extension Approaches

Table 2: Agricultural Extension Agents' Attitudes Towards Electronic Extension Methods (n=160)

Statement	Mean Value
Helps in communicating with mentors easily	3.73
Provides important information and knowledge to mentors	3.73
Gives absolute freedom to express opinions	3.69
Stimulates competition among agricultural extension agents	3.68
Helps mentors benefit from discussions of others	3.67
Transfers information quickly and effectively	3.66
Allows enough time for discussion and dialogue	3.65
Eliminates shortages in the number of extension agents	3.63
Overcomes spatial limitations	3.63
Removes psychological barriers between mentor and mentee	3.61
One of the most effective extension methods for recipients	3.53
Widely used and may be an effective alternative to traditional methods	3.53

This table demonstrates how agricultural extension agents see the use of electronic extension tools favorably. Based on their mean values, Table 2 displays the opinions of agricultural extension agents on electronic extension techniques. The statements with the highest ratings show that electronic extension methods provide for freedom of expression (mean = 3.69), permit easy communication with mentors (mean = 3.73), and supply crucial information and knowledge (mean = 3.73). Other noteworthy advantages include facilitating the rapid and efficient exchange of information (mean = 3.66), as well as encouraging competitiveness among agricultural extension agents (mean = 3.68). Furthermore, electronic extension techniques assist in removing extension agent shortages (mean = 3.63) and overcoming communication difficulties related to geography and psychology.

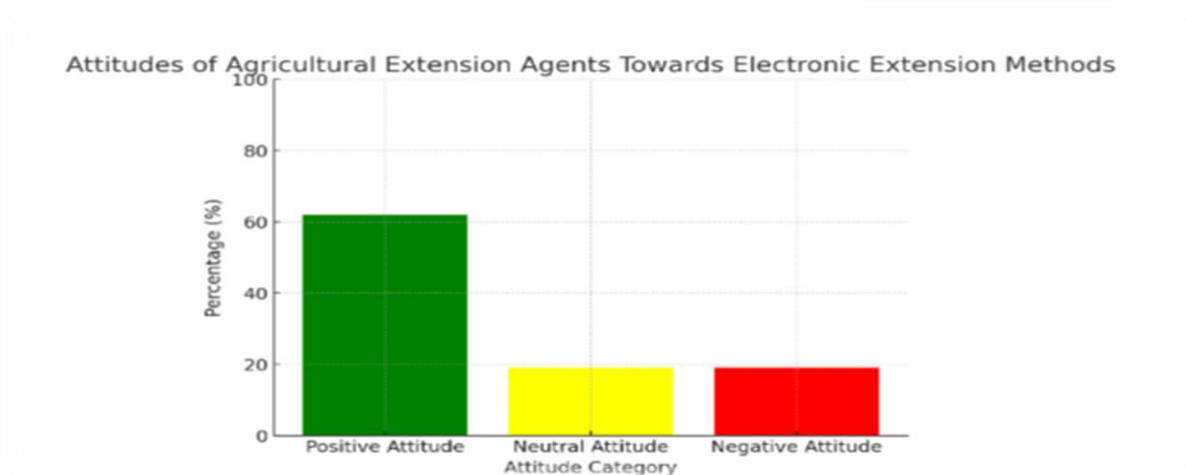
The numerical significance of agricultural extension agents' opinions regarding contemporary extension techniques

Three groups of agricultural extension agents were formed based on their views towards electronic extension methods, which ranged from 13 to 65:

- Negative perspective (less than thirty)
- A neutral perspective (30 to less than 43)
- A positive outlook (above 43)

Table 3: Attitudes of Agricultural Extension Agents Towards Electronic Extension Methods (n=160)

Attitude Category	Range of Scores	Percentage of Respondents
Positive attitude	43 and above	62%
Neutral attitude	30 to less than 43	19%
Negative attitude	Less than 30	19%

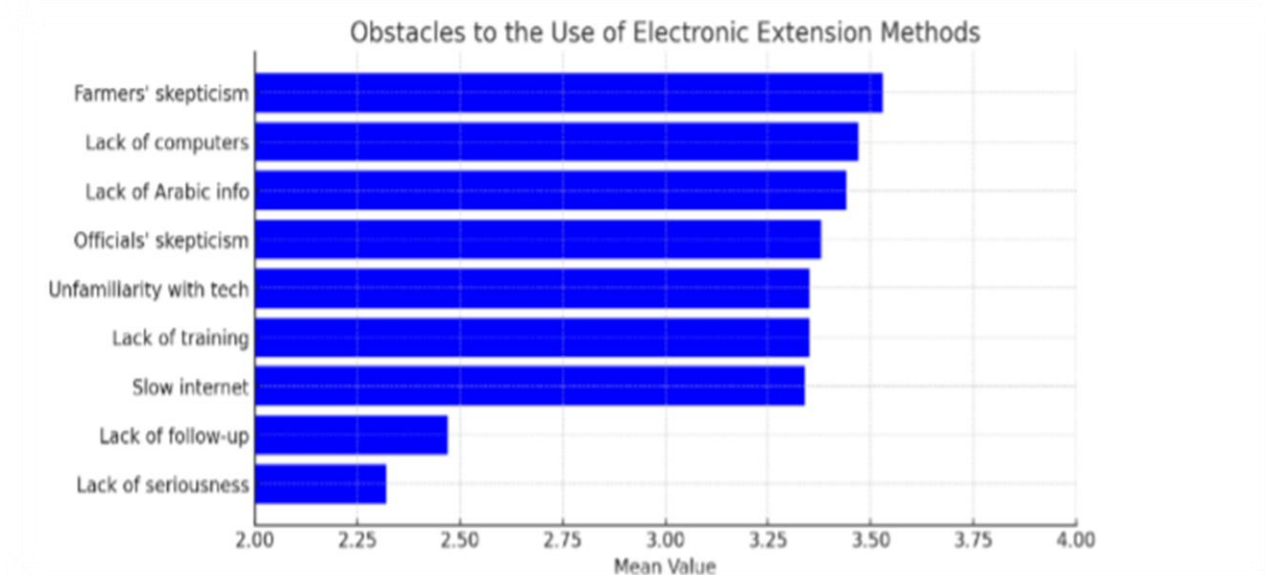


According to the results, 62% of Pakistani agricultural extension agents have a favorable opinion of electronic extension techniques, whereas 19% are indifferent and 19% are negative. In line with the growing integration of digital services in agricultural extension, a higher attitude score within the sample indicates a positive trend towards the use of contemporary agricultural extension techniques.

Obstacles to the Use of Electronic Extension Methods

Table 4: Obstacles to the Use of Electronic Extension Methods (n=160)

Obstacle	Mean Value
Farmers are not convinced of the efficiency of electronic extension methods	3.53
Lack of computers for farm outreach professionals	3.47
Lack of local language agricultural information online	3.44
Some officials are not convinced of the importance of electronic extension methods	3.38
Unfamiliarity of extension agents with computers	3.35
Insufficient training in electronic extension methods	3.35
Slow or unavailable internet access	3.34
Lack of follow-up by extension agents on websites related to electronic extension	2.47
Some farm outreach professionals are not serious about using electronic methods	2.32

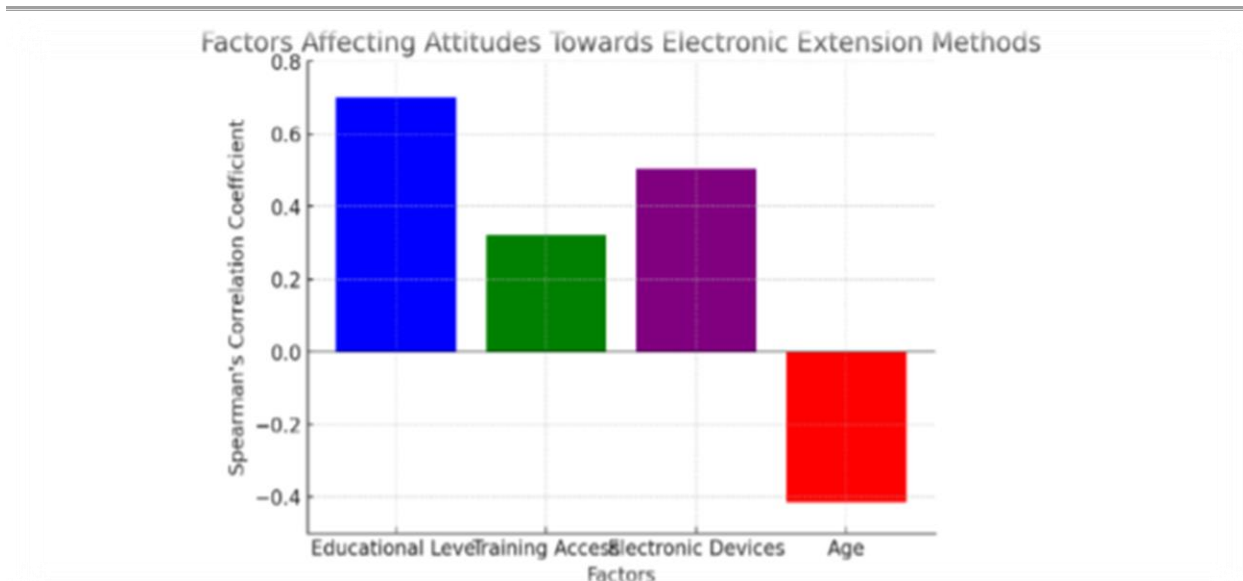


The barriers to the use of electronic extension techniques as viewed by agricultural extension agents are shown in Table 4. The biggest obstacles include farmers' lack of belief in the effectiveness of electronic extension techniques (mean = 3.53), their restricted computer access (mean = 3.47), and the dearth of online local / regional languages agricultural information sources (mean = 3.44). Additional difficulties include delayed internet connectivity, a lack of proper training, and certain extension agents' lack of commitment to using electronic means.

Factors Affecting Agricultural Extension Agents' Attitudes Towards Electronic Extension Methods

Table 5: Factors Affecting Agricultural Extension Agents' Attitudes Towards Electronic Extension Methods (n=160)

Independent Variable	Spearman's Correlation Coefficient (r)	Significance Level (p)
Educational Level	0.701	0.01
Access to Training	0.321	0.01
Availability of Electronic Devices	0.504	0.01
Age	-0.415	0.01



According to the Spearman correlation study (Table 5), the attitude of agricultural extension agents towards electronic methods is significantly positively correlated with educational attainment, training accessibility, and the availability of electronic devices at the 0.01 level. These factors' respective association values are 0.701, 0.321, and 0.504, indicating that access to technology, training, and higher education all contribute to more favorable sentiments. On the other hand, opinions on electronic extension methods and age showed a strong negative connection ($p = 0.01$). This implies that older extension agents are less likely to use contemporary electronic techniques, either as a result of their unfamiliarity with digital instruments or preference for more conventional methods.

Regression Analysis of Factors Influencing Attitudes

Table 6: Regression Analysis of Factors Influencing Attitudes Towards Electronic Extension Methods (n=160)

Predictor variable	Beta coefficient	Significance level (p)	Variance explained (%)
Educational level	0.51	0.01	53%
Age	-0.32	0.01	
Availability of electronic devices	0.43	0.01	

To identify the main determinants of agricultural extension agents' opinions towards electronic extension techniques, a stepwise multiple regression analysis was carried out. The findings show

that 53% of the variance in views towards electronic extension methods may be explained by factors such as age, educational attainment, and availability to electronic devices. These results demonstrate how crucial access to knowledge and technology is in influencing extension workers' readiness to use contemporary techniques.

Conclusion

The study emphasizes how crucial access to technology, knowledge, and training are in influencing agricultural extension agents' perceptions of electronic extension techniques. Older agents typically favor more conventional approaches, whereas younger, more experienced agents with access to electronic gadgets have a more favorable attitude. Improving the efficacy of electronic agricultural extension services in Pakistan would require tackling issues like farmer skepticism, sluggish internet access, and a lack of training.

Recommendations

Improving the availability of technology, information, and training for extension workers is crucial to increasing the efficacy of electronic agricultural extension services in Pakistan. While older agents favor traditional approaches, younger agents with greater expertise and access to electronic equipment tend to view e-extension tactics more favorably. To close this generational divide and promote wider use of electronic extension services, focused training initiatives should be created. It's also critical to address important issues including farmer skepticism, poor internet connectivity, and insufficient training. To increase confidence in digital agricultural solutions, policymakers and stakeholders should fund the development of better internet infrastructure in rural regions, offer practical training to agents and farmers, and launch awareness campaigns. Pakistan can improve the impact and reach of its agricultural extension services by addressing these problems, which will eventually help farmers and the agriculture industry overall.

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