Comparative Effectiveness of Extension and Advisory Service (EAS) Providers in a Pluralistic Extension System of West Bengal

ABSTRACT

Agriculture employs a staggering population in India; most are small and marginal. Extension and Advisory Services (EAS) are crucial for uplifting the rural poor. The extension approach has seen several paradigms shift from relying solely on public extension to a more pluralistic approach with increased roles of private, non-governmental, and community-based organizations. For measuring effectiveness from existing literature, seven indicators, namely, Accessibility, Accountability, Relevancy, Responsibility, Timeliness, Cost Effectiveness, and Empathy, and 25 statements were initially selected and sent to 60 judges for relevancy. From the 52 responses received, the relevancy weightage of each statement was calculated, and based on that, 19 statements were finalized. And these statements were used to measure the effectiveness of farmer's perception regarding the effectiveness of different EAS providers, namely, ATMA and Dept of Agriculture, KVK, Input Dealers, and FPCs in three West Bengal districts, namely, Birbhum, Jalpaiguri, and Nadia. 20 farmers for each extension advisory service provider were considered, totaling 80 in each study district, and 240 respondents from three study districts constituted the sample for the study. Combining the mean perception, the effectiveness was calculated and compared among the EAS providers. It was found that FPC was perceived as the most effective EAS provider, whereas ATMA and DoA, Input Dealer, and KVK ranked second, third, and fourth, respectively.

Key Words: Pluralistic Extension, Effectiveness, Extension and Advisory Service (EAS), Perception, Relevancy Weightage

Introduction

Agriculture is the backbone of our country and employs a staggering 48% of its total population of 139.34 crore in farming activity (1). Extension and Advisory Services (EAS) are crucial to disseminating existing research to these populations throughout the length and breadth of the country (2). EAS has seen a major paradigm shift in its approach, mode of action, and delivery of services since its inception (3). There has been a shift in increased criticism of the transfer-of-technologies approach to promoting methods based on facilitation, learning processes, and increased capacity to innovate. Today's EAS providers are varied and work toward different goals. An additional shift is focusing on a wider range of services emphasizing income, market connections, food and nutrition security, and enhanced well-being rather than just agricultural productivity (4,5). A third change has been the transition from exclusively public advisory services to pluralistic EAS, where private, non-governmental, and community-based organizations now play a bigger role (6,7). Pluralism in agricultural extension in India refers to various institutions, models, and organizations (public, commercial, community-based, NGOs, etc.) that satisfy farmers' needs for guidance, information, and support services (8). Despite Extension's highly pluralistic nature, there is a different perception about the effectiveness of the actors involved in it (9). In India,

farmers' perceptions about successful extension strongly emphasize the adequacy, quality, and utility of advisory services and the staff's responsiveness (10). Farmers perceive effective extension services in India as crucial for enhancing productivity and sustainability. However, perceptions vary due to financial constraints, cultural barriers, and inconsistent policy support, impacting these services' overall effectiveness and reach in different regions (11). Location-specific, customized solutions and better extension agent training are crucial for an effective extension of technologies (12). Public extension systems were more successful in a pluralistic environment. Still, private organizations control the distribution of key agricultural inputs like pesticides and fertilizers, suggesting a move towards a private supply of new technologies (13). Public, corporate, non-governmental, and community-based extension services must be encouraged to share duties, integrate, and develop competencies to address concerns about operational efficiency and declining financial support for public extension. Further, more information on public, commercial, and non-governmental extension is required to draw a meaningful conclusion about the best extension option and to develop the future extension strategy (14). In such context, the study is conducted to compare the farmers' perceived effectiveness among four Extension and Advisory Service Providers i.e. Agricultural Technology Management Agency (ATMA) and Dept of Agriculture (DoA), Krishi Vigyan Kendra (KVK), Farmer Producer Companies (FPCs) and Input Dealers in a pluralistic system.

Materials and Method

After a rigorous literature review based on the framework by Birner *et al.* (2009) (15), the SERVQUAL method by Parasuraman *et al*. (1988) (16), and expert consultation, seven effectiveness indicators were selected, namely, Accessibility, Accountability, Relevancy, Responsibility, Timeliness, Cost Effective and Empathetic. From existing literature 25 statements under 7 indicators were sent to 60 judges for relevancy test with help of three-point scale Less Relevant=1, Relevant=2 and Most Relevant=3 (17,18,19). From the 52 judges' response Relevancy Percentage (RP), Mean Relevancy Score (MRS) and Relevancy Weightage (RW) were calculated using this formula (20).

RP = (Frequency score of most relevant and relevant / Number of Judges) x 100

RW = (Actual score obtained for the item / Maximum obtainable score)

MRS = Actual Scores obtained for the item / Number of Judges

19 Statements with relevancy percentage (RP) above 85, relevancy weightage (RW) above 0.85, and mean relevancy score (MRS) above 2.30 were included in this study. Farmers' perceptions regarding these indicators were captured through 19 statements. Each statement was measured through a Five-point scale where 5 = Strongly Agree, 4= Agree, 3 = Neutral, 2 = Disagree, and 1 = Strongly Disagree. Three West Bengal districts were specifically chosen based on cropping intensity. Low Cropping Intensity Jalpaiguri (<Mean-SD) and Medium Level Birbhum (Mean+SD to Mean-SD) and the district of Nadia (>Mean+SD), which has a higher cropping intensity were chosen. Four EAS Providers selected from each district: ATMA and DoA, KVK, FPC, and Input Dealer. Twenty beneficiary farmers were chosen from each

EAS Provider, constituting 240 farmers—80 from each district. Finally, the Effectiveness of each EAS provider was calculated using the mean of all seven indicators.

RESULTS AND DISCUSSION

Table 1 shows the final statements retained based on the above criteria19 statements are retained under 7 indicators. In further analysis, these statements were considered for measuring the perception of beneficiaries.

Table 1: Selected items under the seven dimensions of effectiveness

	RP	RW	MRS
A. Accessibility			
i. Easily Approachable	93.22	0.92	2.62
ii. Provides solution to your doorstep/close proximity	86.76	0.89	2.38
iii. Good connectivity from your home	85.32	0.88	2.39
B. Accountability			
iv. Knowledgeable	95.29	0.91	2.61
v. Experienced	89.54	0.94	2.36
vi. Up to date knowledge	86.74	0.89	2.35
vii. Diverse Field of Knowledge	86.33	0.87	2.34
C. Relevancy			
viii. Services are suitable to local condition.	92.55	0.95	2.33
ix. Services are high quality	87.31	0.86	2.32
x. Services are highly useful	89.34	0.93	2.40
D. Responsibility			
xi. Personnel/officers are highly service oriented and always willing to support the farmers.	86.65	0.89	2.42
xii. The agency informs farmers when service will be provided.	87.75	0.95	2.39
xiii. The agency helps farmers to get benefit of welfare scheme.	85.4	0.91	2.34
E. Timeliness			
xiv. Consistent response within promised time frame is provided.	92.21	0.87	2.42
xv. Provides information timely when needed.	91.32	0.94	2.47
F. Cost Effective			
xvi. Information is made available on free of cost or minimal cost	88.25	0.86	2.37

xvii. Even if the information is chargeable, I would like to pay	90.37	0.91	2.34
G. Empathetic			
xviii. Involves in regular interaction with farmers and give personalized attention	92.54	0.92	2.52
xix. Having interest for upliftment of farmers	90.77	0.88	2.38

Table 2 shows the beneficiary distribution across the four EAS providers taken for this study. It is evident that all the 240 Farmers, i.e., 100%, are beneficiaries of Input Dealer. However, 60 beneficiaries were taken under KVK; later, 103 farmers (42.91%) were found to be associated with KVK. Similar findings are evident for FPC, of which a total of 102 (42.5%), and for ATMA and DoA,117 farmers (48.75%) received benefits from the above organization. So, to capture the perception of effectiveness, only the beneficiaries associated with each EAS provider are allowed to respond.

Table 2: Beneficiary Distribution

District	Input Dealer	KVK	FPC	ATMA & DOA
Birbhum	80	33	32	31
Jalpaiguri	80	35	34	45
Nadia	80	35	36	41
Total	240(100%)	103(42.91%)	102(42.5%)	117(48.75%)

*Note – the total is not 100%, as some respondents received benefit from multiple EAS providers.

Table 3 shows the statement-wise perception of the beneficiaries of respective EAS providers. Input Dealer was the most easily accessible; it usually provides service in proximity and was located at a place with good connectivity from the beneficiary house. It was also found to be the most accessible EAS provider as perceived by the farmer. Whereas for Accountability indicators, KVK professionals emerged as the most accountable with the highest perception about Knowledgeable and Diverse fields of knowledge. ATMA and DoA personnel were perceived as Experienced and having Up-to-date knowledge. For Relevancy indicators, Input Dealers were found to be the most relevant ones, and the services they offer are perceived as most useful, of high quality, and suitable for local conditions. FPC was found to be the most responsible EAS provider, whereas the personnel of FPC were highly service-oriented and informed beneficiaries about the services offered. ATMA and DoA personnel were mostly perceived as responsible for welfare schemes. For the timeliness indicators, input dealers came up with the highest overall perception and timely information delivery, whereas ATMA and DoA were found to provide consistent responses. Again, ATMA and DoA were found to be more cost-effective with all the statements for the Cost-Effective indicators. Finally, FPC was found to be the most empathetic EAS provider as it had regular interaction with the beneficiary and had an interest in the upliftment of the farming community.

Table 3: Perception of Effectiveness Indicators

	KVK (n= 103)	ATMA & DOA (n=117)	FPC (n=102)	Input Dealer (n=240)
A. Accessibility				
i. Easily Approachable	1.45	2.56	4.76	4.9
ii. Provides solution to your doorstep/close proximity	1.22	1.90	3.88	4
iii. Good connectivity from your home	1.94	1.90	2.73	4.5
Total	4.61	6.36	11.37	13.40
Mean	1.54	2.12	3.79	4.47
B. Accountability				
iv. Knowledgeable	4.45	3.65	3.27	2.10
v. Experienced	2.95	3.23	2.75	3.10
vi. Up to date knowledge	3.12	3.21	2.61	2.50
vii. Diverse Field of Knowledge	4.12	2.90	2.21	1.90
Total	14.64	12.99	10.84	9.60
Mean	3.66	3.25	2.71	2.40
C. Relevancy				
viii. Services are suitable to local condition.	2.40	2.10	3.07	3.50
ix. Services are high quality	2.10	2.60	2.08	2.90
x. Services are highly useful	3.20	3.20	2.67	3.90
Total	7.70	7.90	7.82	10.30
Mean	2.57	2.63	2.61	3.43
D. Responsibility				
xi. Personnel/officers are highly service oriented and always willing to support the farmers.	4.10	3.90	4.16	2.45
xii. The agency informs farmers when service will be provided.	3.70	3.20	3.82	2.70
xiii. The agency helps farmers to get benefit of welfare scheme.	3.50	4.10	4.06	2.65
Total	11.30	11.20	12.04	7.80
Mean	3.77	3.73	4.01	2.60
E. Timeliness				
xiv. Consistent response within promised time frame is provided.	3.80	4.10	3.57	3.20
xv. Provides information timely when needed.	2.70	2.60	3.47	4.10
Total	6.50	6.70	7.03	7.30
Mean	3.25	3.35	3.52	3.65
F. Cost Effective				

xvi. Information is made available on free of cost or minimal cost	4.10	4.20	3.66	2.12
xvii. Even if the information is chargeable, I would like to pay	2.40	2.90	2.08	2.20
Total	6.50	7.10	5.74	4.32
Mean	3.25	3.55	2.87	2.16
G. Empathetic				
xviii. Involves in regular interaction with farmers and give personalized attention	2.54	2.94	3.63	2.10
xix. Having interest for upliftment of farmers	3.10	3.30	3.55	2.30
Total	5.64	6.24	7.18	4.40
Mean	2.82	3.12	3.59	2.20

In Table 4, the Effectiveness of EAS providers, after combining all the indicators, is shown by taking all the indicators' mean. FPC (3.30) was the most effective of all the EAS providers. In contrast, ATMA and DoA (3.11) were found to rank second in effectiveness. and Input Dealer (2.99) and KVK (2.98) were ranked third and fourth respectively. Comparative Effectiveness and all the indicators were visualized in Figure 1.

Table 4: Comparative Effectiveness among EAS Providers

	Accessibility	Accountability	Relevancy	Responsibility	Timeliness	Cost Effective	Empathetic	Effectiveness	Rank
KVK (n= 103)	1.54	3.66	2.57	3.77	3.25	3.25	2.82	2.98	4
ATMA & DOA (n=117)	2.12	3.25	2.63	3.73	3.35	3.55	3.12	3.11	2
FPC (n=102)	3.79	2.71	2.61	4.01	3.52	2.87	3.59	3.30	1
Input Dealer(n= 240)	4.47	2.40	3.43	2.60	3.65	2.16	2.20	2.99	3

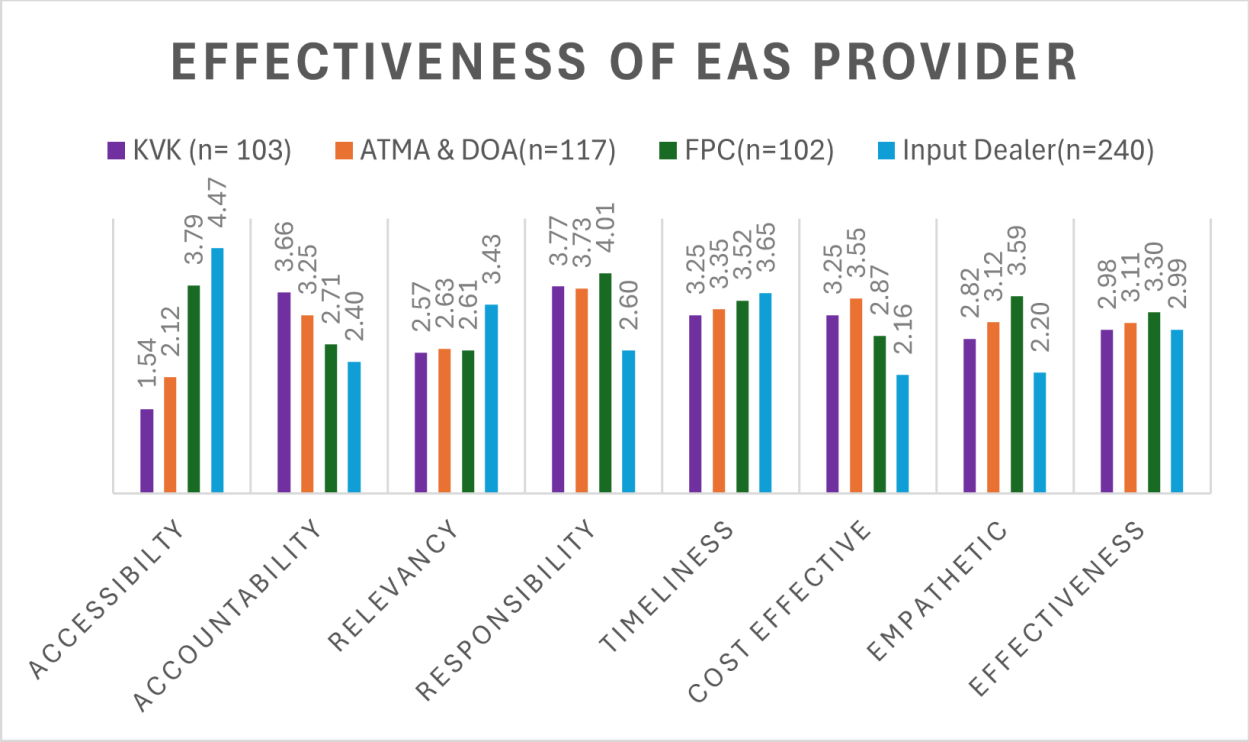

Figure 1: Comparative effectiveness of EAS Providers

Conclusion-

Several actors work together to address the needs of farmers in a pluralistic extension system. Effective service delivery by these actors is crucial. However, for every EAS there are certain strengths and weaknesses. Beneficiaries' perceptions must be documented for the policy-related framework and reform options. 19 statements under 7 indicators were found to be relevant for measuring the perception. Farmer Producer Company, a community-based business organization, is found to be most effective as it operates from the community and with high empathy and responsibility. The input dealer is highly accessible and relevant and provides timely service to their beneficiary. KVK personnel were found to be the most accountable EAS provider. Finally, ATMA and DoA were found to be the most cost-effective ones. This implies that a robust pluralistic system comprising public, private, and non-governmental organizations is needed to bridge the knowledge gap to ensure the well-being of the farming community.

Disclaimer (Artificial intelligence)

Option 1:

Author(s) hereby declare that NO generative AI technologies such as Large Language Models (ChatGPT, COPILOT, etc.) and text-to-image generators have been used during the writing or editing of this manuscript.

Option 2:

Details of the AI usage are given below:

1.

2.

3.

References

1. Agricultural Census Division, All India Report on Agriculture Census 2015-16. Department of Agriculture, Cooperation and Farmers Welfare, Ministry of Agriculture and Farmers Welfare, New Delhi; 2020.
2. Anderson, J. R., & Feder, G. (2004). Agricultural extension: Good intentions and hard realities. *The World Bank Research Observer*, *19*(1), 41-60.
3. "Swanson, Burton E.; Rajalahti, Riikka. (2010). Strengthening Agricultural Extension and Advisory Systems: Procedures for Assessing, Transforming, and Evaluating Extension Systems. Agriculture and Rural Development Discussion Paper; No. 45. © World Bank, Washington, DC. http://hdl.handle.net/10986/23993
4. Cristóvão, A., Koutsouris, A., & Kügler, M. (2012). Extension systems and change facilitation for agricultural and rural development. In Farming systems research into the 21st century: The new dynamic (pp. 201-227). Springer, Dordrecht.
5. Faure, G., Davis, K. E., Ragasa, C., Franzel, S., & Babu, S. C. (2016). Framework to assess performance and impact of pluralistic agricultural extension systems: The best-fit framework revisited (Vol. 1567). Intl Food Policy Res Inst.
6. Mukherjee, A., Bahal, R., Burman, R. R., Dubey, S. K., & Jha, G. K. (2012). Conceptual convergence of pluralistic extension at Aligarh District of Uttar Pradesh. Journal of Community Mobilization and Sustainable Development, 7(1), 85-94.
7. Ferroni, M and Zhou, Yuan (2013). Achievements and challenges in agricultural extension in India. Global Journal of Emerging Market Economies, 4(3):319-346.
8. vk, Sajesh. (2018). Pluralism in Agricultural Extension in India: Imperatives and Implications. Economic Affairs. 63. 10.30954/0424-2513.4.2018.27.

9. Glendenning, C. J., Babu, S., and Asenso-Okyere, K. (2010) *Review of agricultural extension in India: Are farmers' information needs being met*. IFPRI Discussion Paper Series 01048. Washington, DC: International Food Policy Research Institute (IFPRI), 48.
10. Ragunath, S., Goudappa, S. B., Shashidhar, K. K., Tulasiram, J., Reddy, B. S., & Wali, V. B. (2023). Index development perspective and farmer's perception of market-led extension and advisory Services by Producers organization in India. *Asian Journal of Agricultural Extension, Economics & Sociology*, *41*(9), 139-148.
11. K., S., Anil., P., N., Bhat., Rahul, Prasad, R., C, M, Rajesh., Abhishek, Jadhav., K., N., Manohar., H., M., Nandini. (2024). 3. A Review on Impact of Modern Agricultural Extension Services on Smallholder Farm Productivity and Sustainability in India. Journal of Experimental Agriculture International, doi: 10.9734/jeai/2024/v46i72669
12. K., Ananda., Ankit, Pal., Anamika, Sharma., Ramesh, Chand, Bunkar., Sulekha., Mohammed, Umar, Ali., Lalit, Upadhyay. (2024). 2. A Review on Scaling Up Successful Agricultural Extension Techniques for Global Benefit. Journal of experimental agriculture international, doi: 10.9734/jeai/2024/v46i72638Singh, A. K., & Narain, S. (2016). Capacity and willingness of farmers to pay for extension. *Indian Research Journal of Extension Education*, *8*(3), 51-54.
13. Krishna, M., Singh., Burton, E., Swanson., Meena. (2013). 4. Reforming India's Pluralistic Extension System: Some Policy Issues. Social Science Research Network, doi: 10.2139/SSRN.2306980
14. Sulaiman, V. R. and Sadamate, V. V.(2000). Privatizing Agricultural Extension in India. Policy paper 10, National Centre for Agricultural Economics and Policy Research (NCAP), New Delhi, India.
15. Birner, R., Davis, K., Pender, J., Nkonya, E., Anandajayasekeram, P., Ekboir, J., ... & Cohen, M. (2009). From best practice to best fit: A framework for designing and analyzing pluralistic agricultural advisory services worldwide. Journal of agricultural education and extension, 15(4), 341-355.
16. Parasuraman, A., Zeithaml, V. A., & Berry, L. L. (1988). Servqual: A multiple-item scale for measuring consumer perc. Journal of Retailing, 64(1), 12.
17. Chaudhari, R. R., Hirevenkanagoudar, L. V., Hanchinal, S. N., Mokashi, A. N., Katharki, P. A., & Banakar, B. (2007). A scale for measurement of entrepreneurial behaviour of dairy farmers.
18. Mukherjee, A., Singh, P., Rakshit, S., & Burman, R. R. (2018). Development and standardization of scale to measure farmer's attitude towards farmers' producer company. *Indian Journal of Extension Education*, *54*(4), 84-90.
19. Vijayan, B., Nain, M. S., Singh, R., & Kumbhare, N. V. (2022). Knowledge test for extension personnel on National Food Security Mission. *Indian Journal of Extension Education*, *58*(2), 191-194.
20. Khalkho, R., & Ghosh, S. (2023). Crafting a Gender Disparity Index to Unveiling the Tea Garden Workers' Gender Dynamics. *Indian Journal of Extension Education*, *59*(4), 145-149.