

Modalities, Effectiveness and Accessibility of Extension Services Delivered to the Clienteles in the Municipality of Guinobatan, Province of Albay

Jayson N. Olayta*, Roscefe B. Dy

Bicol University Guinobatan - Guinobatan, Albay, Philippines 4503

*Corresponding Author

DOI: <https://dx.doi.org/10.47772/IJRISS.2025.909000216>

Received: 24 September 2025; Accepted: 30 September 2025; Published: 06 October 2025

ABSTRACT

Agricultural extension is crucial for improving productivity, food security, and rural livelihoods. This study examined the modalities, effectiveness, and accessibility of extension services provided by Agricultural Extension Workers (AEWs) in Guinobatan, Albay. Guided by the Diffusion of Innovations framework and participatory extension approaches, a descriptive research design was employed, with farmer respondents drawn from forty-four barangays. Results show that AEWs commonly used farm and home visits, office consultations, and community meetings. These services were perceived as effective in fostering technology adoption, climate adaptation, and sustainable practices, though gaps remained in transparency and farmer participation in program planning. Accessibility was rated very high, with proximity and timeliness most valued. Demographic differences emerged: farmers with diverse or complex operations perceived services as less effective and accessible, while married farmers reported better access, underscoring the role of social and economic contexts. The study concludes that AEWs are generally successful in delivering responsive services but need to adopt more inclusive and participatory strategies to address farmers' heterogeneity. Strengthening local government support through capacity-building in sustainable agriculture, digital tools, and collaborative planning can enhance extension delivery and maximize its contribution to rural development.

Keywords: Agricultural extension services, effectiveness, accessibility, farming operations, local governance

INTRODUCTION

Agricultural extension is important for increasing productivity, ensuring food security, raising rural livelihoods, and placing agriculture at the forefront of pro-poor economic growth, according to (IFPRI.). The main aim is to arm farmers with necessary education, skills, and technical information to make informed decisions to manage their farms effectively. Agricultural Extension Workers (AEWs) are the power behind the inclusive growth and development of the agricultural sector. Agricultural Extension Workers are trained professionals to carry out extension services, which serve as an intermediary between the farmer and other aspects of agricultural technology to improve productivity. Since the enactment of the Local Government Act of 1991, which transferred agricultural extension services to local governments, the morale of Agricultural Extension Workers (AEWs) has generally declined because of various resource, governance, and policy-related issues.

This impacts the delivery of professional extension services at the front lines and diminishes the performance of the agricultural sector and the potential benefits agricultural extension activities may offer to farmers and fisherfolk. Moreover, some local governments prioritize agriculture and therefore lack enough financial resources for extension programs and services, resulting in functional and occupational inequalities among AEWs. These were some of the challenges the government put forward the Magna Carta for Agricultural

Extension Workers with an aim to support and empower Agricultural Extension Workers, for the recognition of the crucial role AEWs play in agricultural development, and their rights and welfare in general.

Unlike the traditional classroom-oriented approaches, these workers emphasize informal techniques, practices, and performances to train, build capacity, and transfer agricultural technology to farm families for the improvement of farming systems (Ovharhe et al., 2020). The regulatory framework in the Philippines, specifically the Local Government Code of 1991, decentralized the extension function from a central government overseeing services to Local Government Units (LGUs), where general agricultural extension is placed on the LGUs.

Extension serves as a crucial pillar for both rural community progress and as part of an agricultural research and development strategy. Agricultural research becomes beneficial when it addresses real problems on the ground, delivering solutions to farmers through appropriate forms of extension services, which, in turn, focus on the acceptance and adoption of these technologies by users. Agricultural extension services can be offered by three primary sources: the public sector, private non-profit sector, and private for-profit sector. The public sector consists of ministries, departments of agriculture, agricultural research organizations, foundations, community boards, and associations. The private for-profit sector consists of commercial production and marketing firms, commercial farmers or farmer group-operated enterprises, agro-marketing and processing firms, trade associations, and private consulting and media companies.

However, there were limitations in the existing literature. Although grounded in the capability challenges and training needs of agricultural extension workers, it did not analyse broadly at policy level. There has also been very limited research into what the common challenges and strategies might be across different types of agricultural landscapes. This study aimed to fill these gaps; it sought to identify the demographic profile of the respondents, understand the extension modalities used by Agricultural Extension Workers (AEWs), assess the level of effectiveness, evaluate the quality of services, and identify the challenges encountered. This research could provide valuable insights for enhancing implementation and offer recommendations for capability enhancement.

More knowledge was needed and additional studies exploring the specific challenges faced by agricultural extension workers in delivering services. This research built on existing studies by focusing on the extension delivery services of Agricultural Extension Workers (AEWs), an area that had yet to be thoroughly investigated in previous studies. The study significantly contributed to their knowledge about Agricultural Extension Workers (AEWs) by filling this research gap.

By enhancing the implementation and effectiveness of Agricultural Extension Workers (AEWs), this study benefited society by improving agricultural productivity, promoting sustainable farming practices, and contributing to food security. In addition, this study is significant because it addresses the needs of farmers, particularly in the Municipality of Guinobatan. To measure the extension quality services performed by the agricultural extension workers in the Municipality of Guinobatan, the researcher aimed to propose recommendations for capability enhancement. The effect of Mandanas law on more LGU's budgetary allocations, as cited in the Mandanas law affects the capacities of agricultural extension workers. This financial autonomy becomes the means of feeding LGUs with fiscal muscle that can be used effectively to sharpen and sharpen talents and make the extension workers more effective. Fiscal decentralization influences their capabilities and in line with fiscal transformation, the study also dealt with the appraisal of agricultural extension workers.

Objectives of the Study

This study aimed to assess the extension delivery services offered by agricultural extension workers in the Municipality of Guinobatan. Specifically, it aimed to:

1. Determine the extension modalities used to implement extension delivery services to the farmers.

2. Determine the level of effectiveness of the services offered by agricultural extension workers.
3. Determine the accessibility of the services offered by agricultural extension workers to farmers.
4. Determine the relationship between the farmer respondents' demographic profiles and the effectiveness and accessibility of services provided by the AEWs.

METHODOLOGY

This study employed descriptive research design to comprehensively appraise the effectiveness and accessibility of services provided by agricultural extension workers to farmers. A descriptive study aims to accurately and comprehensively describe a population, circumstance, or phenomenon. The descriptive research strategy involves examining one or more variables using diverse research techniques (McCombes, 2019). The study was conducted in the Municipality of Guinobatan covering forty-four barangays.

The study utilized survey questionnaire that the respondents answered through interviews. A face-to-face interview was conducted to gather reliable data for the study. Each respondent's data was treated confidentially unless given the authority to disclose this personal data. The study's respondents were farmers proportionally distributed per barangay as representation sample. The list of the respondents was gathered from the LGU Municipal Agriculture Office, specifically from farmers registered in the Registry System for Basic Sectors in Agriculture (RSBSA) in the municipality of Guinobatan.

To collect the required data, the researchers used simple random sampling technique in which every sample had an equal opportunity to be chosen. They randomly selected respondents who were already part of their municipality's Registry System for Basic Sectors in Agriculture (RSBSA). The researchers administered the data collection by establishing a courtesy visit to the barangay officials explaining the purpose of the study. The interview were conducted at the farmer's residence upon approval from the local leaders and with the barangay officials assigned. After completing the data collection, tabulation was done manually using Microsoft Excel. The data was presented in tabular form and summarized using frequency, percentage and weighted means. Spearman correlation was applied to test significant relationships between variables. Analysis were conducted with a 95% confidence level and a 5% margin of error. Data encoding and processing were performed using MS Excel and IBM SPSS Statistics.

RESULTS AND DISCUSSION

Extension modalities used in the implementation of extension delivery as perceived by the clientele

The data on extension delivery services shows that farmers rely on a diverse mix of modalities, with farm/home visits (12.52%), group/community meetings (11.34%), and group training (10.66%) emerging as the most frequently accessed approaches. These findings align with research indicating that direct, face-to-face interaction remains the backbone of effective extension delivery in developing countries, as it fosters trust, contextualized advice, and real-time problem solving (Anderson & Feder, 2004; Rivera & Qamar, 2003). The relatively high share of office calls (10.54%) also suggests that farmers actively seek formalized interactions with extension workers, reflecting a demand-driven orientation where clientele proactively pursue services (World Bank, 2012). Such participatory engagement underscores the continued importance of personalized and community-based extension methods in ensuring the credibility and applicability of agricultural innovations (Davis, Swanson, & Amudavi, 2012).

At the same time, the moderate uptake of farm tours (7.42%), technology demonstrations (7.29%), and print media (7.92%) highlights farmers' interest in experiential and visual learning. Demonstrations and tours are well-documented to be effective in diffusing innovations, as they allow farmers to observe outcomes under real conditions, thereby reducing uncertainty and accelerating adoption (Feder, Just, & Zilberman, 1985; Rejesus et al., 2012). The sustained use of print media reflects that traditional communication channels still play a role, particularly in rural areas with limited digital penetration. However, the relatively low usage of broadcast media (2.61%) and e-learning (2.63%) suggests that mass and digital modes have yet to achieve

wide acceptance, possibly due to infrastructure limitations, digital literacy barriers, or preferences for interpersonal exchanges (Rivera & Sulaiman, 2009; Aker, 2011).

Interestingly, newer communication modes such as telephone/text/email (7.04%) and digital media (3.20%) are gaining traction, reflecting a gradual shift toward ICT-enabled extension. This transition is consistent with global trends in “digital agriculture,” where mobile phones and online platforms expand the reach of advisory services and lower delivery costs (Aker, 2011; World Bank, 2012). Yet, their relatively modest share in the dataset compared to face-to-face approaches suggests that ICTs currently serve more as complements than substitutes to traditional methods. The persistence of school-on-the-air (3.54%) and others such as caravans (1.81%) also underscores the hybrid nature of extension delivery, blending mass communication with localized outreach to maximize coverage and inclusivity (Gerpacio et al., 2004).

Overall, the distribution of extension delivery modalities suggests that farmers prefer direct, interactive, and experiential learning opportunities, while still engaging moderately with print and ICT-based tools. This reflects the dual challenge of extension systems in developing contexts: sustaining high-trust, interpersonal engagement while gradually mainstreaming cost-effective digital innovations (Anderson & Feder, 2007; Davis et al., 2012). To enhance impact, extension strategies should adopt a pluralistic and integrated approach, combining traditional farm visits and group methods with ICT-based platforms, ensuring accessibility across diverse socio-economic and literacy levels.

Table 1. Distribution of respondents based on extension modalities used in the implementation of extension delivery services in the service area

Extension Delivery Services	Farmer Clientele	
	Frequency*	Percentage (%)
1. Farm/Home Visits	297	12.52
2. Office Calls	250	10.54
3. Informal Contacts	109	4.59
4. Telephone Calls, Text Messaging, letters/emails	167	7.04
5. School-on-the-Air	84	3.54
6. Group/Community Meetings	269	11.34
7. Demonstrations	90	3.79
8. Field Day	73	3.08
9. Farm Tours	176	7.42
10. Group Training	253	10.66
11. Digital Media	76	3.20
12. Broadcast Media	62	2.61
13. Print Media	188	7.92
14. E-learning	63	2.63
15. Technology Demonstrations	173	7.29
16. Others (Caravan etc.)	43	1.81
Total	2373	

*multiple responses

Effectiveness of agricultural extension services delivered by the AEWs as perceived by the farmer clienteles.

The highest-rated service is "through office calls are provided in a timely manner," which pointed out a underpinning of a responsive communication essential to effectively meets the farmers' needs. It indicates that

farmers regard the timeliness of dealing with their grievances as of great value. The lowest-rated service is "show transparency in their actions and decisions related to program development," which implies that there is still much to be done to improve this area. It may require considerable improvement, with more transparency and open communication of decisions and actions to help build trust and program effectiveness. Maintaining responsiveness and building transparency will fortify the overall efficacy of AEWs' services. Hence, agricultural extension workers are an enabling agency for promoting adoption and productivity as agents of technology dissemination and use. A general weighted mean of 4.35 implies that the services from Agricultural Extension Workers in the service areas are highly effective, as evidenced by a consistent high score in nearly all dimensions of their role, including the introduction of new technologies, addressing climate challenges, education of farmers on sustainable practices, and positive rapport building.

Appropriate extension advice should be provided for farmers' needs regarding the adoption of new practices and climate-resilient technologies (Mubita and Nyambre, 2019 and Ochola et al., 2020). For AEWs, improvement has been emphasized in terms of adaptability to climate variability and the quality of service delivery through the adoption of localized and knowledge-based practices emphasized by Kassie and Teklewold (2018). Participatory approaches, such as those of Priyadarsini and Gupta (2021) and Dwiartama and Roshetko (2020), give rise to greater satisfaction, targeted inputs, and longer-lasting effects due to farmers' involvement at the planning and decision level. According to Johnson and Alhassan (2019), co-designing leads to ownership. According to Adesope and Matthews (2018), timely feedback and open monitoring are helpful in empowering farmers through collaboration to achieve common goals. Transparency and flexibility, as highlighted by Lopez et al. (2020) and Nadeem and Tayo (2022), are significant to building trust, strengthening relations, and enhancing the program's outcome. AEWs deliver quality, impactful services per the farmer's needs because they are proactive, work with meaningful collaboration, and consider feedback. This holistic approach supports sustainable agricultural progress.

Table 2. Effectiveness of services delivered by the AEWs as perceived by the farmer clientele in Municipality of Guinobatan

Statements	Weighted Mean	Verbal Interpretation
1. Promotes adoption of new technologies and practices among farmers.	4.37	Highly Effective
2. Provide practical solutions and recommendations for addressing agricultural challenges posed by climate change.	4.33	Highly Effective
3. Through office calls are provided in timely manner.	4.43	Highly Effective
4. Demonstrate comprehensive knowledge of local agricultural conditions and challenges.	4.33	Highly Effective
5. Effectively educate farmers on sustainable farming practices.	4.38	Highly Effective
6. Promotes farmers participation and engagement in the decision-making process.	4.34	Highly Effective
7. Promotes collaboration and communication between farmers and extension workers.	4.37	Highly Effective
8. Demonstrate a good understanding of farmers' needs and priorities.	4.36	Highly Effective
9. Effectively involve farmers in the planning stage of agricultural programs.	4.33	Highly Effective
10. Provide sufficient guidance and support during the monitoring phase of agricultural programs.	4.35	Highly Effective
11. Actively engage farmers in evaluating the outcomes of agricultural programs.	4.33	Highly Effective
12. Show flexibility in adapting program strategies based on farmers' feedback.	4.31	Highly Effective

13. Encourage active participation of farmers in decision-making processes related to program development.	4.34	Highly Effective
14. Actively seek feedback from farmers to enhance the effectiveness of their services.	4.34	Highly Effective
15. Show transparency in their actions and decisions related to program development.	3.33	Highly Effective
16. Maintain a positive relationship with farmers, fostering trust and collaboration in program implementation.	4.41	Highly Effective
General Weighted Mean	4.35	Highly Effective

Legend: 4.21-5.00 – Highly Effective; 3.41-4.20 - Effective; 2.61-3.40 – Neither Effective nor Ineffective; 1.81-2.60 – Ineffective; 1.00-1.80 – Highly Ineffective

Accessibility of agricultural extension services delivered by the AEWs as perceived by the Farmers

Results in Table 3 show that farmers strongly agree with the accessibility of services delivered by Agricultural Extension Workers (AEWs), with a general weighted mean of 4.39. This indicates that AEWs' services are not only available but also relevant and responsive to farmers' needs. Accessibility in this context reflects more than physical proximity; it also entails timeliness, clarity of communication, and appropriateness of content (Anderson & Feder, 2007).

The highest-rated indicator, “are accessible and easy to reach”, highlights the importance of proximity of the specified location in extension service delivery. Consistent with Masanja, Shausi, and Kalungwizi (2023), farmers' perception of accessibility often depends on how easily they can interact with AEWs through farm visits, community meetings, or informal channels. When AEWs are approachable, it fosters trust and increases the likelihood of farmers adopting innovations. Similarly, the high rating for “help me improve my harvest and crop quality” pointed out that farmers equate accessibility with tangible outcomes, such as productivity gains. Extension services that are easy to access and responsive to immediate needs—like pest management or strategies for long-term practices have been shown to strengthen farmers' confidence in extension programs (Mubita & Nyambe, 2019). This aligns with the findings of Davis (2010), who emphasized that extension effectiveness is ultimately measured by improvements in farm productivity and income.

Meanwhile, the relatively lower score for “adequate and appropriate for farmers' needs” signals that while services are generally accessible, there remains a gap in tailoring interventions to diverse farm operations. Farmers with more complex or varied farming systems often perceive extension as less relevant, since standardized recommendations may not fit their unique circumstances (Hossain & Islam, 2010). This finding aligns with the study's correlation results, which showed that farmers engaged in multiple farming enterprises found services less effective and less accessible.

The result for “shows empathy and understanding towards situation” reinforces the importance of interpersonal relationships in extension. As Priyadarsini and Gupta (2021) argue that participatory and empathetic approaches improve farmer engagement and long-term adoption of practices. Extension is not only about technical expertise but also about social capital—building trust and rapport with farmers (Adesope & Matthews, 2018).

Overall, the analysis reveals that AEWs in the Municipality of Guinobatan deliver highly accessible services that expand farmers' knowledge, improve yields, and support income growth. However, the slightly lower rating on adequacy underscores the need for differentiated, farmer-centered approaches. As Lopez et al. (2020) stressed out, enhancing transparency, flexibility, and customization in service delivery can bridge this gap.

Table 3. Accessibility of Services delivered by the AEWs as perceived by the Farmers

Accessibility of Services	Weighted Mean	Verbal Interpretation
1. Expand my knowledge and understanding of new technologies and farming practices among farmers.	4.39	Strongly Agree
2. Help me improve my harvest and crop quality.	4.46	Strongly Agree
3. Help me increase my income from farming.	4.39	Strongly Agree
4. Help me address pest problems on my farm.	4.35	Strongly Agree
5. Provide strategies on farming practices that farmers use in the long term.	4.36	Strongly Agree
6. Are accessible and easy to reach.	4.47	Strongly Agree
7. Are delivered in a timely manner.	4.38	Strongly Agree
8. Are clear and effective.	4.42	Strongly Agree
9. Demonstrate their relevant skills, knowledge, and reliability in delivering extension services.	4.38	Strongly Agree
10. Are adequate and appropriate for farmer's needs.	4.33	Strongly Agree
11. Shows empathy and understanding towards situation.	4.41	Strongly Agree
General Weighted Mean	4.39	Strongly Agree

Legend: 4.21-5.00 – Strongly Agree; 3.41-4.20 - Agree; 2.61-3.40 – Neutral; 1.81-2.60 - Disagree; 1.00-1.80 – Strongly Disagree

Relationship between the Demographic Profile of Farmers and Effectiveness of Services

The correlation results indicate that most demographic characteristics—age, sex, civil status, educational attainment, years in farming, and monthly income—were not significantly related to farmers' perceptions of extension service effectiveness, suggesting that services are broadly inclusive and accessible across different social groups (Anderson & Feder, 2004; World Bank & IFPRI, 2010; Rivera & Qamar, 2003). This reflects the strength of participatory and experiential approaches such as demonstrations, field schools, and broadcast programs, which reduce dependence on literacy or socioeconomic status (Gerpacio et al., 2004; Rejesus et al., 2012). The only significant relationship was observed for farming enterprise, where rice farmers perceived services as less effective, possibly due to their greater reliance on government and extension programs for staple crop production and higher expectations for technical and institutional support (David & Otsuka, 1994; Estudillo & Otsuka, 1999). This finding underscores the need for commodity-specific, targeted interventions in rice farming, while maintaining inclusive extension delivery that benefits diverse farmer profiles.

Table 4. Relationship between the Demographic Profile of Farmers and Effectiveness of Services

Demographic Profile	Effectiveness	Correl Value	P-Value	Decision	Interpretation
Age	Effectiveness of Services	0.032	0.563	Failed to Reject Ho	Not Significant
Sex		0.004	0.949	Failed to Reject Ho	Not Significant
Civil Status		0.084	0.130	Failed to Reject Ho	Not Significant
Educational Attainment		-0.073	0.186	Failed to Reject Ho	Not Significant
Years in Farming		0.032	0.568	Failed to Reject Ho	Not Significant
Farming Enterprise (Rice Farming)		-0.163	0.003	Reject Ho	Significant
Monthly Income		-0.084	0.130	Failed to Reject Ho	Not Significant

Legend: ± 0.90 to 1.00 - Very high positive (negative) correlation; ± 0.70 to 0.90 - High positive (negative) correlation; ± 0.50 to 0.70 - Moderate positive (negative) correlation; ± 0.30 to 0.50 - Low positive (negative) correlation; ± 0.00 to 0.30 - Negligible correlation

Relationship between the Demographic Profile of Farmers and Accessibility of Services

Table 5 shows the relationship between the demographic profile of farmers in terms of age, sex, civil status, educational attainment, number of years in farming, farming operations, and monthly income and its significant relationship to the accessibility of services of agricultural extension workers. The correlation results reveal that most demographic factors—age, sex, educational attainment, and years in farming—were not significantly related to accessibility of extension services, suggesting that programs in the municipality reach farmers broadly across age groups, genders, schooling levels, and farming experience, consistent with studies showing that well-designed extension delivery mechanisms are generally inclusive across socio-demographic lines (Anderson & Feder, 2004; Rivera & Qamar, 2003; World Bank & IFPRI, 2010). However, civil status ($r = 0.121$, $p = 0.028$) was significantly associated with accessibility, indicating that married or family-based farmers may have greater networks or obligations that enhance their access, a trend also noted in social capital and group membership research (Feder, Birner, & Anderson, 2011). Likewise, farming enterprise ($r = -0.146$, $p = 0.008$) was significant, with rice farmers perceiving lower accessibility—possibly reflecting their higher dependency on government support and expectations for crop-specific interventions (David & Otsuka, 1994; Estudillo & Otsuka, 1999). Finally, monthly income ($r = -0.110$, $p = 0.047$) was also significant, suggesting that lower-income farmers face more constraints in accessing services, echoing evidence that economic status can influence mobility, access to information, and participation in programs (Davis, Swanson, & Amudavi, 2012; Meinzen-Dick et al., 2011). These findings highlight the need for targeted approaches to ensure equitable accessibility, particularly for rice farmers and lower-income groups, while reinforcing the overall inclusivity of extension services across other demographic categories.

Table 5. Relationship between the Demographic Profile of Farmers and Accessibility of Services

Demographic Profile	Accessibility	Correl Value	P-Value	Decision	Interpretation
Age	Accessibility of Services	-0.031	0.576	Failed to Reject Ho	Not Significant
Sex		0.003	0.951	Failed to Reject Ho	Not Significant
Civil Status		0.121	0.028	Reject Ho	Significant
Educational Attainment		-0.028	0.611	Failed to Reject Ho	Not Significant
Years in Farming		0.024	0.669	Failed to Reject Ho	Not Significant
Farming enterprise		-0.146	0.008	Reject Ho	Significant
Monthly Income		-0.110	0.047	Reject Ho	Significant

Legend: ± 0.90 to 1.00 - Very high positive (negative) correlation; ± 0.70 to 0.90 - High positive (negative) correlation; ± 0.50 to 0.70 - Moderate positive (negative) correlation; ± 0.30 to 0.50 - Low positive (negative) correlation; ± 0.00 to 0.30 - Negligible correlation

CONCLUSION

The study revealed that agricultural extension workers (AEWs) in the Municipality of Guinobatan deliver services through diverse modalities, including farm and home visits, office calls, group meetings, digital tools, and print media. Among these, farm/home visits and community-based interactions were the most frequently utilized, reflecting the importance of direct, personal, and community-driven engagement in agricultural extension. Services provided by AEWs were rated highly effective, particularly in promoting the adoption of new technologies, educating farmers on sustainable practices, and maintaining responsive communication. However, transparency in program development was identified as the weakest area, suggesting a need for greater openness and participatory decision-making. AEWs' services were generally perceived as highly accessible with ease of access and timeliness being the strongest attributes. Nonetheless, a minor gap remained in ensuring that services were adequately tailored to the unique needs of farmers with diverse farming operations.

The study also established that farmers' demographic characteristics influenced their perceptions of effectiveness and accessibility. Specifically, those engaged in multiple or diverse farming operations perceived AEWs' services as less effective, while higher-income farmers and those with complex farming enterprises found services less accessible. Conversely, married farmers perceived services as more accessible, likely due to greater household stability and support networks. Overall, the findings highlight the strengths of AEWs in delivering relevant, timely, and accessible services, while also underscoring areas for improvement such as transparency, inclusivity, and tailoring of support for farmers with diverse operations and higher income levels. The results point to the importance of differentiated and need-based extension approaches, enhanced training for AEWs, and stronger support from Local Government Units (LGUs) in adopting sustainable farming, digital tools, and participatory strategies. By addressing these gaps, AEWs can further strengthen their role as catalysts of agricultural productivity, food security, and rural development in the region.

REFERENCES

1. Adesope, A. A., & Matthews, J. O. (2018). Monitoring and evaluation practices in agricultural extension: A participatory approach. *Journal of Agricultural Extension and Rural Development*, 10(3), 67-77.
2. Adesope, O. M., & Matthews, T. (2018). Participatory approaches in agricultural extension: Impacts on farmer empowerment and productivity. *Journal of Agricultural Education and Extension*, 24(2), 121–136.
3. Aker, J. C. (2011). Dial “A” for agriculture: A review of information and communication technologies for agricultural extension in developing countries. *Agricultural Economics*, 42(6), 631–647.
4. Anderson, J. R., & Feder, G. (2004). Agricultural extension: Good intentions and hard realities. *The World Bank Research Observer*, 19(1), 41–60.
5. Anderson, J. R., & Feder, G. (2007). Agricultural extension. In R. Evenson & P. Pingali (Eds.), *Handbook of Agricultural Economics* (Vol. 3, pp. 2343–2378). Elsevier.
6. David, C. C., & Otsuka, K. (1994). *Modern rice technology and income distribution in Asia*. Boulder: Lynne Rienner.
7. Davis, K. (2010). New directions for agricultural extension and advisory services in Africa. *Journal of International Agricultural and Extension Education*, 17(3), 51–63.
8. Davis, K., Swanson, B., & Amudavi, D. (2012). Review and recommendations for strengthening the agricultural extension system in Kenya. IFPRI Discussion Paper.
9. Davis, K., Swanson, B., Amudavi, D., Ayalew, D., Flohrs, A., Riese, J., Lamb, C., & Zerfu, E. (2010). In-depth assessment of the public agricultural extension system of Ethiopia and recommendations for improvement. IFPRI Discussion Paper No. 01041. International Food Policy Research Institute (IFPRI). Washington, D.C. <https://www.scirp.org/reference/referencespapers?referenceid=2514869>
10. Dwiartama, A. D., & Roshetko, J. M. (2020). Agroforestry as a model of sustainable land use of small-scale private forest: a case study in Sumedang, West Java. *ACIAR Monograph MN221*, Australian Centre for International Agricultural Research.
11. Estudillo, J. P., & Otsuka, K. (1999). Green Revolution, human capital, and off-farm employment: Changing sources of income among farm households in Central Luzon, 1966–1994. *Economic Development and Cultural Change*, 47(3), 497–523.
12. Feder, G., Birner, R., & Anderson, J. R. (2011). The private sector's role in agricultural extension systems: Potential and limitations. *Journal of Agribusiness in Developing and Emerging Economies*, 1(1), 31–54.
13. Feder, G., Just, R. E., & Zilberman, D. (1985). Adoption of agricultural innovations in developing countries: A survey. *Economic Development and Cultural Change*, 33(2), 255–298.
14. Gerpacio, R. V., Labios, J. D., Labios, R. V., & Dikitanan, R. C. (2004). Maize in the Philippines: Production systems, constraints, and research priorities. CIMMYT.
15. Hossain, M. Z., & Islam, M. A. (2010). Farmers' perception about the extension services and extension workers: The case of organic agriculture extension program by PROSHIKA. ResearchGate. Retrieved from https://www.researchgate.net/publication/40832681_Farmers'_Perception_about_the_Extension_Servi

ces_and_Extension_Workers_The_Case_of_Organic_Agriculture_Extension_Program_by_PROSHIK
A

16. Hossain, M. Z., & Islam, M. A. (2010). Role of agricultural extension services in promoting organic farming in Bangladesh. *Asian Journal of Agriculture and Development*, 7(2), 123–136.
17. Lopez, C., Garcia, L., & Handa, A. (2020). Transparency and trust in agricultural extension services. *Journal of Rural Development*, 29(2), 178-192.
18. Lopez, C., Rivera, M., & Klerkx, L. (2020). Transforming extension services: Towards participatory, transparent, and flexible models. *Agricultural Systems*, 177, 102715.
19. Masanja, I., Shausi, G. L., & Kalungwizi, V. J. (2023). Accessibility of agricultural extension services among smallholder farmers in Tanzania. *African Journal of Rural Development*, 8(1), 45–59.
20. Masanja, Iman & Shausi, Gosbert & Kalungwizi, Vituce. (2023). Factors Influencing Rural Farmers' Access to Agricultural Extension Services Provided by Private Organizations in Kibondo District, Tanzania. *European Journal of Agriculture and Food Sciences*. 5. 115-122. 10.24018/ejfood.2023.5.5.722.
https://www.researchgate.net/publication/375232490_Factors_Influencing_Rural_Farmers'_Access_to_Agricultural_Extension_Services_Provided_by_Private_Organizations_in_Kibondo_District_Tanzania
21. McCombes, S. 2019, May 15. Descriptive Research | Definition, Types, Methods & Examples. Scribbr. Retrieved from <https://www.scribbr.com/methodology/descriptive-research/>
22. Meinzen-Dick, R., Quisumbing, A., Behrman, J., Biermayr-Jenzano, P., Wilde, V., Noordeloos, M., ... & Beintema, N. (2011). Engendering agricultural research. IFPRI.
23. Mubita, A., & Nyambe, J. (2019). Effectiveness of agricultural extension services in Zambia: Farmer perspectives. *International Journal of Agricultural Extension*, 7(2), 67–75.
24. Mubita, M., & Nyambe, M. (2019). Capacity of AEWs in technology transfer and productivity improvement. *African Journal of Agricultural Research*, 15(3), 201- 210.
25. Nadeem, M., & Tayo, A. (2022). Building accountability in agricultural extension through collaborative monitoring. *Agricultural Development Quarterly*, 38(1), 54- 72.
26. Ochola, R. O., Kiprop, E., & Njeru, R. (2020). Localized advice by AEWs and technology adoption in Kenya. *International Journal of Agricultural Extension*, 25(4), 312-325.
27. Priyadarsini, P., & Gupta, S. (2021). Participatory methods in agricultural extension: Enhancing service delivery. *Journal of Agricultural Services*, 13(1), 104- 115.
28. Priyadarsini, R., & Gupta, V. (2021). Participatory extension approaches and farmer satisfaction: A comparative study. *Indian Journal of Extension Education*, 57(3), 12–18.
29. Reyes, R. M., Mutuc, M. E., Palis, F. G., Lapitan, A. V., Chi, T. T. N., Hossain, M., & Brett, J. B. (2012). The impact of integrated pest management information dissemination methods on insecticide use and efficiency: Evidence from rice-farming in the Philippines. *American Journal of Agricultural Economics*, 94(1), 120–137.
30. Rivera, W. M., & Qamar, M. K. (2003). Agricultural extension, rural development and the food security challenge. FAO.
31. Rivera, W. M., & Sulaiman, R. V. (2009). Extension: Object of reform, engine for innovation. *Outlook on Agriculture*, 38(3), 267–273.
32. World Bank & IFPRI. (2010). Gender and governance in rural services: Insights from India, Ghana, and Ethiopia. World Bank.
33. World Bank. (2012). Agricultural innovation systems: An investment sourcebook. World Bank.