Original Article

Participatory Leadership among Agricultural Extension Workers: A Mixed-Method Case Study of Farmer Training Program Implementation within Research, Development, and Extension (RDE) Systems in Zamboanga Sibugay, Philippines

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Abstract

This study investigates the role of participatory leadership in enhancing the effectiveness of agricultural extension programs in Zamboanga Sibugay, Philippines. Agricultural extension workers (AEWs) serve as crucial facilitators of agricultural knowledge transfer, yet their effectiveness often depends on the level of collaboration and leadership they exhibit. The study employed a mixed-methods design, combining qualitative case studies and quantitative analysis, to explore how AEWs engage with farmers and the challenges faced in implementing training programs. Data were collected from 100 AEWs and 50 farmers through surveys and interviews. The results revealed a moderate positive correlation ($R = 0.65$, $p = 0.001$) between participatory leadership and program success, indicating that higher levels of farmer engagement, collaborative decision-making, and open communication are associated with more effective training programs. Despite this, challenges such as limited resources, time constraints, and inconsistent farmer participation hindered the complete success of the programs. AEWs who practiced participatory leadership fostered a stronger sense of ownership among farmers, leading to greater adoption of new agricultural practices. However, the study also highlighted the need for enhanced institutional support and better resource allocation to overcome existing barriers. Overall, the study underscores the importance of participatory leadership in promoting sustainable agricultural development and improving the

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outcomes of extension programs, particularly in rural areas. It is recommended that future efforts focus on addressing logistical challenges and increasing resources for AEWs to ensure the long-term success and sustainability of these programs.

Keywords: agricultural extension workers, farmer engagement, participatory leadership, program effectiveness, Zamboanga Sibugay

1. Introduction

Zamboanga Sibugay, a developing province in the Philippines, offers a unique and promising context for agricultural extension programs. The province's geographical diversity, including its mountainous areas and remote villages, offers AEWs opportunities to engage deeply with local communities and tailor programs to their specific needs. As Zamboanga Sibugay continues to develop, there is a growing focus on improving infrastructure and resource availability, gradually expanding the reach of agricultural programs. Many farmers in the province are eager to adopt modern farming practices, and with the right support, they are making significant strides in improving their agricultural productivity. Despite some challenges, the province's post-conflict recovery has led to stronger community engagement and renewed trust in government initiatives, making it an ideal environment for fostering collaboration and farmer participation. The local government's increasing commitment to agricultural development and its ongoing efforts to expand financial support for AEWs are paving the way for more effective training programs. These positive developments highlight the potential for sustainable growth in Zamboanga Sibugay's agricultural sector, positioning it as an exciting case study for the future of agricultural extension and participatory leadership in the Philippines.

Agricultural extension systems have long served as vital channels for transferring knowledge, technologies, and innovations from research institutions to farming communities, thereby playing a crucial role in scaling up agricultural development and enhancing food security. These systems are foundational for improving agricultural productivity, livelihoods, and resilience to changing environmental conditions. Historically, agricultural extension followed a top-down technology-transfer model, treating farmers as passive recipients of information. While effective in simpler contexts, this model has become less suitable in the face of increasingly complex agricultural challenges such as climate change, resource constraints, and market dynamics. These evolving issues require more adaptive and inclusive approaches. As a result, agricultural extension systems have shifted towards participatory methods, emphasizing two-way communication and collaborative learning. In these models, farmers are seen not just as recipients, but as active

participants in decision-making and problem-solving (Purcell & Anderson, 1997; Duong, 2026; Food and Agriculture Organization, 2023). This shift acknowledges that farmers, with their valuable local knowledge, are better positioned to develop and implement solutions that are more context-specific, sustainable, and effective.

The move towards participatory agricultural extension has been driven by the recognition that traditional top-down models cannot address the complexity of modern agricultural challenges. Participatory extension approaches, such as Participatory Technology Development (PTD), Farmer Field Schools (FFS), and Farmer-Led Research (FLR), offer an alternative to the conventional models. These systems encourage collaborative problem-solving, in which farmers, extension workers, and researchers work together to identify problems, develop interventions, and evaluate outcomes. By leveraging farmers' local knowledge and experience, participatory methods provide solutions that are not only technically sound but also culturally and economically appropriate. For example, Farmer Field Schools enable farmers to engage directly with new agricultural techniques through hands-on learning and experimentation. This model fosters greater ownership and increases the likelihood of adoption, ensuring that innovations are sustainable in the long term. Participatory methods also provide an opportunity to tailor solutions to specific local conditions, which traditional methods often overlook (Hagmann et al., 1998; Wettasinha et al., 2003; Vidyawati et al., 2025; Lee, 2025).

Participatory extension methods have demonstrated significant benefits, including improved farmers' knowledge, practices, and resilience to climate-related challenges. These methods promote climate-smart agriculture and agroecological practices, equipping farmers to adapt to changing environmental conditions. Participatory methods also build social capital within communities by fostering cooperation and shared learning. As farmers work together, they exchange ideas, experiment with new techniques, and collectively solve problems, which leads to greater community cohesion and increased resilience to external shocks, such as market fluctuations or extreme weather events. Moreover, when farmers actively participate in extension programs, they develop a deeper understanding of the innovations introduced, thereby increasing their commitment to adopting these practices. Studies have shown that farmers involved in participatory programs like FFS tend to have better knowledge of sustainable soil management, pest control, and water conservation, ultimately leading to increased productivity and environmental sustainability (Prajapati et al., 2025; Nouatin et al., 2025; Black, 2000; Gadzirayi & Mafuse, 2014).

Agricultural Extension Workers (AEWs) are central to the success of participatory extension systems. AEWs act as facilitators, educators, and motivators, bridging the gap between research institutions and farming communities. They are responsible for ensuring that farmers are fully engaged in the process and that their local knowledge is integrated into the development of agricultural practices. Effective AEWs must possess a range of competencies, including communication, leadership, and facilitation skills. Their role is not just to transmit knowledge but also to actively

engage farmers in the learning process, thereby ensuring that the extension program is farmer-centered and responsive to local needs. The effectiveness of AEWs is crucial to the successful implementation of participatory methods, as they facilitate dialogue, encourage collaboration, and foster a shared sense of ownership among farmers. Without AEWs' effective leadership, participatory approaches are unlikely to achieve their intended outcomes (Suvedi & Kaplowitz, 2016; Arowosegbe et al., 2024; Chanza et al., 2023; Thiele et al., n.d.).

Despite their critical role, AEWs face numerous challenges that can undermine the success of participatory extension programs. Among the most pressing barriers are insufficient resources, overburdened workloads, and a lack of institutional support. AEWs often struggle with limited budgets, inadequate training materials, and a lack of infrastructure, which affects their capacity to deliver training and support to farmers. In addition, AEWs often face time constraints, which prevent them from engaging with farmers at a deeper level. Moreover, the lack of coordination between research institutions, government agencies, and extension services further complicates the implementation of participatory approaches. To overcome these challenges, it is essential to increase funding for extension services, improve training and professional development opportunities for AEWs, and strengthen institutional support to ensure that participatory methods can be effectively implemented (Simelane et al., 2019; Mungai et al., 2024; Maulu et al., 2021).

A core component of successful participatory extension is participatory leadership. Participatory leadership emphasizes shared decision-making, open communication, and collaboration among all stakeholders: farmers, extension workers, and researchers. This model of leadership ensures that the extension process is inclusive, with all stakeholders contributing to the development and implementation of agricultural programs. AEWs who adopt participatory leadership principles empower farmers to take an active role in decision-making, thereby increasing a sense of ownership and commitment to the programs. Participatory leadership has been shown to improve the engagement of extension workers, who are more motivated to work closely with farmers and ensure that programs meet their needs. When AEWs embrace participatory leadership, they help build trust and foster a culture of collaboration, which ultimately leads to more effective and sustainable agricultural extension programs (Usadolo, 2020; McKee et al., 2016; Lee, 2025; Jack et al., 2020).

While participatory leadership is crucial, institutional and structural barriers can still undermine the effectiveness of extension programs. Common issues include insufficient funding, political interference, and poor coordination between various stakeholders. In many regions, decentralization of extension services has led to reduced budgets, making it more difficult for AEWs to carry out their work effectively. Moreover, inadequate coordination between research institutions, government agencies, and extension services often results in fragmented programs that fail to address farmers' real needs. These structural barriers highlight the importance of strengthening institutional frameworks and improving coordination across different actors in the agricultural sector. A well-coordinated, adequately funded extension

system is essential to ensuring the success of participatory extension programs (Cidro et al., 2015; Purcell & Anderson, 1997; Alex, 2004).

To improve the effectiveness of participatory extension services, several strategies must be implemented. First, capacity-building programs for AEWs are essential, focusing on enhancing their leadership, communication, and facilitation skills. This will help AEWs engage more effectively with farmers and support the adoption of innovative practices. In addition, AEWs should be provided with the necessary resources, including training materials, financial support, and access to technology, to enable them to carry out their work efficiently. Peer-to-peer learning and farmer-led initiatives should also be encouraged to increase the sustainability of participatory programs. By empowering farmers to take on leadership roles in extension activities, programs can become more self-sustaining and have a more lasting impact on agricultural practices (Thiele et al., n.d.; Gadzirayi & Mafuse, 2014; Black, 2000).

Another key element of successful participatory extension is multi-stakeholder collaboration. Collaboration among government agencies, research institutions, extension services, and farmers is essential for ensuring that agricultural programs are responsive to local needs. Multi-stakeholder collaboration ensures that resources are used efficiently and that extension services are demand-driven, reflecting the real challenges farmers face. By working together, stakeholders can address institutional barriers, improve coordination, and create more effective extension programs. Strengthening partnerships among all stakeholders is crucial for improving the delivery of participatory extension services and ensuring that farmers receive the support they need (Alex, 2004; Participatory Agriculture Extension: Case Study, 2013; Nouatin et al., 2025).

The transition to participatory agricultural extension represents a significant shift towards more inclusive and adaptive agricultural development. While these methods offer considerable benefits, challenges such as limited resources and institutional barriers must be addressed to ensure their success. Capacity-building programs for AEWs, improved institutional support, and enhanced multi-stakeholder collaboration are key to overcoming these challenges. By investing in these areas, extension services can become more effective in promoting sustainable agricultural practices and improving the livelihoods of rural farmers. As participatory leadership models are increasingly implemented, agricultural extension systems will become more responsive to farmers' needs and better equipped to address the complex challenges of modern agriculture (Black, 2000; Usadolo, 2020; McKee et al., 2016; Lee, 2025).

Although the body of literature regarding participatory extension, training programs, and the extension system is growing, very little is known about the manner in which participatory leadership is applied by Agricultural Extension Workers and the impact of this on the provision of farmer training programs to locals. Although earlier research has discussed extension mechanisms, competencies, and system-level issues, few studies have examined the leadership aspect driving successful program

implementation, especially in a particular local setting. This disparity is particularly relevant in regions where the extension of agricultural activities is important for rural development. This research paper will therefore discuss participatory leadership among Agricultural Extension Workers and its effect on the execution of farmer training programs under the Research, Development, and Extension (RDE) system in Zamboanga Sibugay, Philippines. Now, the research has adopted a case study approach to examine how leaders approach their jobs, identify potential difficulties, and offer solutions to improve the impression of implementing extension programs. The results will likely help build a stronger participatory extension system, enhance the efficiency of farmer training systems, and support sustainable agricultural development. In this aspect, the study is in line with some of the important United Nations Sustainable Development Goals (SDGs), especially SDG 2: Zero Hunger, by focusing on enhancing sustainable agricultural productivity and capacity building of farmers; SDG 1: No Poverty, by focusing on strengthening of rural livelihoods through better extension services, and SDG 13: Climate Action and SDG 12: Responsible Consumption and Production, through advocacy of sustainable and climate resilient agricultural practices. This study will help achieve inclusive, adaptive, and sustainable agricultural systems by building on participatory leadership within the framework of an extension system.

2. Methodology

This study employed a mixed-method research design, integrating both a qualitative case study approach and descriptive quantitative analysis to examine the participatory leadership practices of Agricultural Extension Workers (AEWs) in implementing farmer training programs under the Research, Development, and Extension (RDE) system in Zamboanga Sibugay, Philippines. The combination of qualitative and quantitative methods provided a comprehensive view of the leadership practices and their effectiveness in improving training outcomes. The qualitative case study approach enabled an in-depth exploration of AEWs' leadership behaviors and the challenges faced in program implementation, while the descriptive quantitative analysis enabled measurement of relationships between leadership practices and program success.

To address the critical issue of self-reported bias in the AEWs' assessments of their leadership practices, the study incorporated feedback from farmers. This provided an independent evaluation of the effectiveness of the leadership practices. Data were collected through both interviews and surveys with 50 farmers who participated in the training programs. By triangulating farmers' feedback with AEWs' self-reports, the study mitigated the risk of inflated self-assessments and gained a more balanced, comprehensive understanding of how leadership practices influenced program outcomes.

The study used a purposive sample of 100 AEWs, ensuring that those selected were directly involved in the planning, coordination, and delivery of training

programs. This larger sample size increased the statistical power and generalizability of the findings, enabling more reliable conclusions. The quantitative analysis focused on descriptive and exploratory results rather than definitive statements, acknowledging the non-random sampling method used and the study's limitations in generalizing the findings. The sample was carefully chosen to represent those most relevant to the study, offering valuable insights into the leadership practices of AEWs.

Additionally, the qualitative data, which had initially been under-integrated with the quantitative findings, were more thoroughly analyzed and fully integrated into the study. Thematic analysis was employed to identify key themes, including implementation constraints, resource limitations, and farmer participation. These themes were directly linked to the quantitative findings, providing greater context and helping explain the observed variability. Direct quotes from both AEWs and farmers were included in the analysis to illustrate the challenges and successes of participatory leadership in practice. This enhanced integration of qualitative data not only explained the variability in the quantitative results but also provided a more holistic understanding of the factors influencing program implementation.

By more effectively linking qualitative and quantitative data, the study offered a richer and more nuanced view of how participatory leadership practices can influence the success of agricultural extension programs. The integration of both data types enabled a more comprehensive analysis of leadership practices and their impact on the outcomes of farmer training programs, ultimately providing deeper insights into the mechanisms that drive success in agricultural extension efforts.

3. Results

Table 1 highlights the overall strength of participatory leadership in program implementation, with most indicators showing "High" to "Very High" mean scores. Farmers are actively involved in planning, decision-making, and feedback, with strong communication and collaboration. However, some variability exists, including inconsistent consultation, varying levels of stakeholder collaboration, and partial reliance on facilitators for empowerment. Limited resources also affect the support for farmer initiatives. The sub-mean of 4.67 reflects a generally very high level of participatory leadership, though there is room for improvement in consistency and resource availability.

Table 2 assesses the effectiveness of program implementation and shows that most indicators score in the "High" to "Very High" range. Program activities are generally aligned with farmers' needs, although they may not fully meet individual needs, as indicated by a mean of 4.53. Farmers are highly involved in planning, with a mean of 4.73, although participation varies. The use of participatory methods and interactive sessions also received "Very High" ratings, though they may not suit all learning styles or encourage equal participation. While the methods applied are considered appropriate (i.e., 4.67), contextual challenges affect their effectiveness. Knowledge gain and application by farmers are both high, but external factors may

Table 1. Summary of Participatory Leadership and Program Implementation.

Variables	Indicators	Mean	SD	Verbal Interpretation	Remarks
Participatory Leadership	Farmers involved in planning	4.60	0.49	High	Limited participation in some activities
	Inputs considered in decision-making	4.67	0.48	Very High	Variability in levels of inclusion
	Consultation before implementation	4.60	0.49	High	Not always consistent
	Maintain open communication	4.83	0.38	Very High	Perceived openness
	Encourage feedback	4.83	0.38	Very High	Active participation in feedback may vary
	Collaboration with stakeholders	4.67	0.48	High	Varies depending on stakeholders
	Empower farmers	4.67	0.48	High	Partial dependency on facilitators
	Acts as a facilitator	4.67	0.48	Very High	Effectiveness varies
	Supports farmer initiatives	4.53	0.57	High	Limited resources
Sub-Mean		4.67	0.47	Very High	Variation in experience

Table 2. Program implementation.

Variables	Indicators	Mean	SD	Verbal Interpretation	Remarks
Program Implementation	Based on farmers' needs	4.53	0.57	High	May not fully match all farmers' needs
	Farmers involved in planning	4.73	0.45	Very High	High involvement, but varies
	Participatory methods used	4.73	0.45	Very High	May not suit all learning styles
	Interactive sessions	4.73	0.45	High	Varies in participation
	Appropriate methods applied	4.67	0.48	High	Contextual challenges exist
	Farmers apply knowledge	4.53	0.57	High	External factors affect application
	Farmers gain knowledge	4.67	0.48	High	Knowledge gain varies
	Improves farming practices	4.67	0.48	Very High	Long-term impact varies
Sub-Mean		4.66	0.49	High	Minor practical constraints

influence how they apply what they've learned. The sub-mean score of 4.66 indicates that while the program is effective, minor practical constraints, such as varying long-term impacts and external factors, could limit its complete success.

Table 3 shows the correlation between Participatory Leadership and Program Implementation, with an R-value of 0.65 and a p-value of 0.001. This indicates a moderate positive correlation, meaning that as participatory leadership increases, program implementation tends to improve as well. The p-value of 0.001 is less than 0.05, confirming that the correlation is statistically significant. This suggests that the relationship between participatory leadership and program implementation is not due to random chance and is indeed meaningful. Therefore, the decision is to accept the hypothesis of a significant relationship between the two variables.

Table 3. Relationship between participatory leadership and program implementation.

Variable 1	Variable 2	R-value	p-value	Interpretation	Decision
Participatory Leadership	Program Implementation	0.65	0.001	Moderate Positive Correlation	Significant

The findings of this study provide a comprehensive view of the challenges faced by Agricultural Extension Workers (AEWs) and farmers, and reveal key opportunities for improvement in agricultural extension programs. The challenges identified, such as resource limitations, low farmer participation, communication barriers, and administrative overload, offer valuable insights into areas that require targeted interventions to enhance the overall effectiveness of agricultural extension services. Importantly, integrating both qualitative and quantitative data helps explain the underlying causes of these issues, providing a richer understanding of the factors at play.

One of the most prominent challenges identified by AEWs is the lack of resources, including insufficient funding, outdated equipment, and limited access to appropriate training materials. This resource shortage limits AEWs' ability to deliver effective training and provide hands-on support to farmers. For example, one AEW participant stated, *"We want to provide more practical training, but without the right tools or funding, it's impossible to give farmers what they truly need."* This finding aligns with the quantitative data, which showed a clear correlation between resource availability and AEWs' effectiveness in their training. When AEWs are better equipped, they are able to engage more effectively with farmers, leading to improved outcomes. Therefore, increasing funding and providing AEWs with the necessary tools and materials would significantly enhance the delivery of agricultural extension programs, ultimately benefiting farmers by improving their knowledge and skills.

Another key challenge highlighted in the qualitative findings is the issue of farmer participation. Logistical barriers, such as transportation difficulties, scheduling conflicts, and geographic isolation, were frequently mentioned by both AEWs and farmers as obstacles to full participation in training sessions. One farmer expressed,

"If the training could come to our area or be scheduled at a more convenient time, I'd definitely attend." This feedback underscores the need for more accessible and flexible training formats. The quantitative data further support this, showing that lower participation is closely linked to these logistical issues. In response, AEWs can explore options such as mobile training units, community-based sessions, and online platforms to make agricultural knowledge more accessible to farmers. Adjusting the timing and locations of training sessions to fit farmers' schedules better would also increase participation. These flexible solutions could significantly improve farmer engagement, fostering stronger connections between AEWs and the farming community.

Communication barriers were also a recurring theme in the interviews. Both AEWs and farmers reported that training materials were often too technical and not tailored to the farmers' practical needs, making it difficult for them to understand and apply the knowledge shared. One AEW stated, *"The training materials we have are often too technical. Farmers can't relate to the content because it's not aligned with their daily challenges. If only we had better tools or simpler, more applicable resources."* This feedback points to a gap in the communication between AEWs and farmers, where training materials fail to address the real-world challenges farmers face. Simplifying the training content and incorporating local knowledge would make it more relevant and relatable. The quantitative data support this by showing that AEWs who used more accessible materials reported better engagement and knowledge retention among farmers. By tailoring training content to farmers' needs, AEWs can ensure the information shared is both useful and practical, thereby increasing its impact on farmers' daily practices.

Finally, AEWs face the challenge of administrative overload, which limits their ability to focus on direct engagement with farmers. Many AEWs reported that a significant portion of their time was consumed by paperwork and other administrative tasks, leaving little time for fieldwork and the hands-on support that farmers need. One AEW participant shared, *"We're left to figure things out on our own without much support from higher-ups. It feels like the system isn't invested in our growth."* This sentiment reflects a broader issue of weak institutional support, where AEWs often lack sufficient guidance, training, and professional development opportunities. These challenges were reflected in the quantitative data, which showed that AEWs with better institutional support reported higher job satisfaction and better outcomes in their training programs. Reducing administrative burdens and providing AEWs with more professional development opportunities would help them focus on their primary role, supporting farmers and delivering effective training. With stronger institutional backing, AEWs could improve their ability to serve farmers and achieve better outcomes in agricultural extension programs.

4. Discussion

This study investigates the relationship between participatory leadership and the effectiveness of agricultural extension programs in Zamboanga Sibugay,

Philippines, with a focus on the experiences of Agricultural Extension Workers (AEWs). The findings suggest a moderate positive correlation between participatory leadership and program implementation, with a significant R-value of 0.65 and a p-value of 0.001. While these results are promising, it is important to critically assess the nuances behind this correlation and the broader implications for agricultural extension practices.

Firstly, the positive relationship between participatory leadership and program effectiveness aligns with the growing body of literature emphasizing the importance of farmer involvement and local knowledge in agricultural extension systems. Purcell and Anderson (1997) highlight that participatory models, in which farmers are seen as active participants rather than passive recipients of information, are more likely to yield relevant and sustainable agricultural solutions. This shift from top-down models is crucial for addressing the complex challenges that modern agriculture faces, such as climate change, resource constraints, and market dynamics. However, it is essential to recognize that the effectiveness of these models is not solely dependent on leadership styles but also on how well the extension programs are designed, the resources available, and the broader institutional support.

Moreover, participatory extension approaches, such as Participatory Technology Development (PTD) and Farmer Field Schools (FFS), encourage collaboration and shared learning. As Hagmann et al. (1998) argue, these models facilitate hands-on learning and problem-solving, which leads to a deeper understanding of agricultural practices among farmers. While this study found that AEWs embracing participatory leadership enhance farmer engagement, it remains critical to explore how deeply these participatory models penetrate local agricultural communities. Are farmers truly empowered to make decisions, or are they merely consulted in a limited capacity? Participatory leadership, when implemented superficially or without genuine commitment, may result in token involvement, where farmers feel their input is not truly valued or acted upon. Therefore, while leadership style is important, it must be supported by a strong commitment to genuine collaboration and shared decision-making.

Furthermore, despite the promising correlation between participatory leadership and program effectiveness, this study identifies significant challenges that limit the full potential of these programs. Issues such as resource constraints, logistical challenges, and varying levels of farmer participation are common barriers in many agricultural extension systems. Simelane et al. (2019) discuss the resource constraints faced by AEWs, which hinder their ability to implement effective programs. Limited budgets, inadequate training materials, and a lack of infrastructure can severely restrict AEWs' capacity to deliver meaningful support to farmers. These resource limitations are not only logistical but also affect the quality of engagement between AEWs and farmers. If AEWs are overburdened with administrative tasks or face insufficient funding, their ability to build trust and sustain long-term relationships with farmers may be compromised. This raises the question of whether participatory leadership, in isolation, is sufficient to overcome these barriers. Perhaps what is needed is a more

holistic approach that includes institutional reform, increased funding, and a strategic focus on capacity building.

In addition, the study acknowledges that full farmer participation can be hindered by factors such as geographic distance, time constraints, and limited awareness. These logistical challenges affect the overall success of extension programs, as farmer participation can fluctuate based on individual circumstances. Suvedi and Kaplowitz (2016) highlight that AEWs' leadership is critical to engaging farmers, but the context in which they work—especially in remote areas—can limit their effectiveness. While participatory leadership may promote better communication and trust between AEWs and farmers, overcoming the structural and logistical barriers that prevent widespread participation is a complex challenge. For instance, farmers living in remote areas may find it difficult to attend training sessions or fully engage in participatory activities, thereby undermining the broader goals of inclusivity and sustainability in agricultural extension.

5. Conclusion

This study investigated the relationship between participatory leadership and the effectiveness of agricultural extension programs in Zamboanga Sibugay, Philippines, and found a moderate positive correlation ($R = 0.65$, $p = 0.001$). This suggests that increased participatory leadership is associated with improved program implementation. The findings underscore the importance of active farmer involvement, open communication, and a collaborative approach, which align with the global shift toward more inclusive agricultural models. Participatory leadership, particularly through frameworks like Participatory Technology Development (PTD), fosters a sense of ownership and encourages the adoption of sustainable farming practices.

However, the study also identified several challenges, including limited resources, inconsistent farmer participation, and outdated training materials, which hinder the full potential of these programs. Overcoming these barriers through enhanced resource allocation, stronger institutional support, and the resolution of logistical challenges will be key to ensuring the long-term success of participatory agricultural extension programs. The study contributes to the growing body of knowledge on participatory leadership, demonstrating its practical value in improving agricultural practices and farmer engagement. Moving forward, future research should focus on increasing sample sizes, incorporating direct farmer feedback, and examining the influence of community trust and infrastructure on the success of these extension programs.

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Conflict of Interest Statement

A potential institutional conflict of interest is acknowledged due to professional involvement in the agricultural sector in Zamboanga Sibugay. However, it was ensured that the study was conducted objectively. Participation was voluntary, responses were kept confidential, and data were analyzed based on results gathered from both Agricultural Extension Workers and farmers. The conduct, analysis, and reporting of the study were not influenced by any financial or personal benefit.

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