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"Socio-Demographic Profile, Roles, and Challenges of Agrikulturang Makamasa Barangay Extension Technicians (AMBETs) in Corn Technology Extension Services in District 2, Davao Oriental"

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Abstract

Corn is a vital crop in District 2, Davao Oriental, sustaining food security and rural livelihoods. To strengthen technology transfer, the Department of Agriculture institutionalized Agrikulturang Makamasa Barangay Extension Technicians (AMBETs) under the Agrikulturang Makamasa Program (1998–1999). Their mandate is grounded in Republic Act No. 7160 (Local Government Code of 1991), with local ordinances and resolutions further legitimizing their roles and prescribing incentive guidelines. Despite these legal and political frameworks, limited systematic evaluation has been conducted of their effectiveness in disseminating corn technology. This study determined the socio-demographic profile, roles, and challenges of AMBETs in delivering corn technology extension services in District 2, Davao Oriental. A descriptive design was employed using survey questionnaires administered to 57 AMBETs selected through stratified random sampling across five municipalities. Data were analyzed through frequency distributions and weighted means. Furthermore, the results revealed that AMBETs are predominantly aged 55 and above (45.61%), male (64.91%), and married (78.95%), with modest educational attainment—most being high school graduates (54.39%). Nearly half (47.37%) have 7 or more years of experience in extension and corn technology. All are employed under honorarium-based arrangements, earning ₱1,000–₱3,000 per month, released quarterly, with incentives mainly from LGUs. On the other hand, the roles performed strongly include monitoring/reporting (WM = 4.36), administrative duties (WM = 4.35), and extension/training (WM = 4.23), while community engagement was moderately effective (WM = 4.05). In addition, then challenges include resource and logistical constraints (WM = 3.25), farmer receptiveness (WM = 3.08), low compensation affecting motivation (WM = 2.85), insufficient training (WM = 2.83), and political factors such as budget limitations, partisan influence, and uneven incentive distribution. To conclude, AMBETs are experienced, trusted grassroots extension workers

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who play a critical role in disseminating corn technology. However, systemic issues—aging demographics, limited education, inadequate training, precarious employment, low compensation, and political constraints—undermine their sustainability and effectiveness. Strengthening institutional support, depoliticizing incentive distribution, and enhancing training and compensation structures are essential to sustain AMBET-led agricultural development.

Keywords: AMBETs, corn technology, extension services, political constraints, socio-demographic profile, training, challenges

Introduction

Background of the Study

Corn is the most important crop in the agro-ecological landscape of District 2, Davao Oriental, contributing significantly to local economies and food security. To maximize this potential, the Department of Agriculture (DA), through the Provincial Agriculture Office (PAGRO) and the Corn Program, has introduced various technologies to improve productivity. Since its inception in 1998–1999 under the DA's Agrikulturang Makamasa Program, the Agrikulturang Makamasa Barangay Extension Technicians (AMBETs) have been institutionalized in Davao Oriental to act as intermediaries between government agencies and local farmers at the barangay level. Their mandate is to ensure that corn technologies are transferred efficiently. The institutionalization of AMBETs is firmly grounded in Republic Act No. 7160 (Local Government Code of 1991), which devolves agricultural extension services to local government units (LGUs). This legal mandate empowers provinces, municipalities, and barangays to provide extension services, including farmer training centers, demonstration farms, and technology dissemination.

Building on this framework, AMBETs have been formally recognized through a Sangunian Panlalawigan Proposed Ordinance 17-16-2025*, "an ordinance institutionalizing the Agrikulturang Makamasa Barangay Extension Technician (AMBET), Barangay Fisheries and Aquatic Resource Management Council (BFARMC), and Agricultural and Fishery Council (AFC) as mandated by law for the province of Davao Oriental, appropriating funds therefor, and providing guidelines for its implementation",* and Resolution No. 16-1317-04-2022 *"A resolution confirming the validity of the issuance of Executive Order No. 81, series of 2021, RE: Prescribing guidelines for the provision of incentives for the Agrikulturang Makamasa Barangay Technicians (AMBETs)"* in Davao Oriental, which legitimize their role in barangay-level extension work. These local measures provide the operational backbone of the AMBET system, ensuring that barangay-based technicians are recognized as legitimate partners in agricultural development and are supported through honoraria, logistical assistance, and program integration.

Despite this long-standing implementation, no systematic evaluation of AMBET effectiveness in corn technology adoption has been conducted in District 2, Davao Oriental. Existing studies highlight challenges such as limited training opportunities, insufficient financial support, and political constraints that affect honoraria distribution, hindering AMBETs' capacity to deliver effective services (Gervacio, 2012). These gaps underscore the need for a rigorous assessment of AMBETs' roles, challenges, and impact on farmer adoption outcomes.

Therefore, this study seeks to determine socio-demographic profiles, responsibilities, challenges, of AMBETs. By adopting quantitative approach, the research aims to generate evidence to inform stakeholders in improving extension strategies, strengthening farmer support systems, and enhancing the sustainability of agricultural development in Davao Oriental. Ultimately, the findings will serve as a basis for policy recommendations to improve training programs, financial incentives, and extension methodologies, thereby reinforcing AMBET-led initiatives for long-term impact on rural farming communities.

Disclaimer**:** The study does not measure causal impact on yield through experimental methods.

Statement of the Problem

This study aims to determine the Socio-Demographic Profile, Roles, and Challenges of Agrikulturang Makamasa Barangay Extension Technicians (AMBETs) in Corn Technology Extension Services in District 2, Davao Oriental.

Specifically, it sought to answer the following questions:

1. What is the socio-demographic profile of AMBET in corn technologies in District 2, Davao Oriental, in terms of the following:
    a. Age
    b. Gender
    c. Educational Attainment
    d. Years of Experience as an AMBET
    e. Years of Experience working especially on corn technology
    f. Current employment status as an AMBET
    g. Payment Frequency
    h. Salary range
    i. Sources of Incentives
    j. Training attended
2. What are the specific roles and responsibilities performed by (AMBETs) in corn technology extension services?
3. What challenges do AMBETs face in delivering corn extension services in District 2, Davao Oriental?

Significance of the Study

The result of this study will benefit the following:

Department of Agriculture. The findings of this study will be beneficial at the local, regional, and national levels. The result can shed significant light on AMBETs' difficulties when distributing technology. By identifying training requirements and resource shortages among the AMBETs, this study can assist the Department in formulating policies and programs and in capacity building. This will also open the door for more focused capacity-building programs and other extension services to support the AMBETs in Davao Oriental.

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Policymaking. The findings could serve as a recommendation to policymakers to either develop or enhance programs to improve agricultural extension services, or to intervene where needed to strengthen the AMBETs system to better serve rural communities in Davao Oriental.

Model for Other Regions: If AMBETs prove effective, their modality can serve as a guide for other provinces in the country to improve the agricultural extension system and provide greater support for barangay-level projects, programs, and activities.

Research Institutions and Academe. The research study will add to the knowledge base regarding how effective the AMBETs have become in performing the role of agricultural extension workers at the barangay level in Davao Oriental. Its findings could serve as a reference for future research studies and academic work with similar focus areas. The insights from this study could be used by research institutions for further research and recommendations to capacitate AMBETs in Davao Oriental.

Provincial Government Units. The various provincial government units of Davao Oriental will benefit from this study by gaining deeper insights into the problems this category of AMBETs faces and the strategies required to support them effectively. The findings provide evidence for resource allocation, program enhancement, and agricultural policies required to support the AMBETs in Davao Oriental.

City/Municipal Agriculture Office: It plays a key role in addressing training and support gaps for AMBETs, strengthening their capacity to disseminate new technologies. In District 2, each barangay selected its own AMBETs, ensuring extension services were rooted in local relationships and knowledge. This regional approach fosters collaboration and trust between farmers and extension workers.

Barangays Local Government Units. Barangays are local government units, and the importance of agricultural services at the barangay level for enhancing corn productivity and farmers' engagement in corn production must be emphasized. It further provides guidelines to Barangay Councils on how to support and integrate AMBETs into community programs and resource planning.

Corn farmers: This study finds strengths and gaps in the effectiveness of AMBETs in disseminating corn technologies. This would ensure farmers have the appropriate tools and knowledge to improve their productivity and livelihoods.

Future Researchers. This study provides a framework for exploring rural development, innovation diffusion, and participatory governance, thereby laying the groundwork for further research on agricultural extension approaches. It illustrates productivity, policy, and practice information in real agricultural systems.

Objectives of the Study

The study determine the Socio-Demographic Profile, Roles, and Challenges of Agrikulturang Makamasa Barangay Extension Technicians (AMBETs) in Corn Technology Extension Services in District 2, Davao Oriental". Specifically, this study provided answers to the following objectives:

1. To determine the socio-demographic profile of AMBETs in corn technologies in District 2, Davao Oriental, in terms of the following:
    a. Age
    b. Gender
    c. Civil Status
    d. Educational Attainment
    e. Years of Experience as an AMBET Technician
    f. Years of Experience working especially on corn technology
    g. Current employment status as an AMBET
    h. Payment Frequency
    i. Salary range
    j. Sources of Incentives
    k. Training attended;
2. To identify the specific roles and responsibilities performed by AMBET in corn technology extension services;
3. To determine the challenges faced by AMBETs in delivering corn extension services in District 2, Davao Oriental;

Scope and Limitations of the Study

This study focused on the AMBET extension workers assigned in various barangays in District 2, Davao Oriental. The study was limited to the experiences of AMBETs concerning corn technology and the corn farmers they support but excludes other extension technologies applied at the municipal or provincial levels.

Importantly, the study was limited to determining the Socio-demographic profile, roles and challenges in corn technologies. It does not establish causal impact on yield through controlled experiments.

Definition of Terms

Agrikulturang Makamasa Barangay Extension Technicians (AMBETs) – Barangay-based extension workers institutionalized under the Department of Agriculture's Agrikulturang Makamasa Program (1998–1999). They serve as intermediaries between government agencies and farmers, facilitating the dissemination of corn technologies and providing grassroots-level technical assistance.

Corn Technology – Refers to agricultural innovations introduced under the DA Corn Program to improve productivity, including hybrid seeds, pest and disease management practices, soil fertility measures, and post-harvest technologies.

Extension Services – Activities that involve transferring agricultural knowledge, skills, and technologies from government institutions to farmers. These include training,

Honorarium – The financial incentive or allowance provided by local government units (LGUs) to AMBETs for their extension services.

Local Government Units (LGUs) – Provinces, municipalities, and barangays mandated under Republic Act 7160 (Local Government Code of 1991) to provide agricultural extension services, including farmer training centers, demonstration farms, and technology dissemination.

REVIEW OF RELATED LITERATURE

Related Literature and Studies

Agricultural extension plays a crucial role in bridging the gap between research-based knowledge and its practical application by farmers, with the eventual aim of enhancing agricultural

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productivity and improving livelihoods. The literature review examines the effectiveness of agricultural extension services, focusing on the Agrikulturang Makamasa Barangay Extension Technicians Program in District 2, Davao Oriental, specifically regarding corn technologies. It is relevant to trace the evolutionary development of the extension approaches, indicate the importance of extension in corn production, and investigate the challenges and opportunities inherent in the technology transfer process

Socio-Demographic Profile of AMBETs

The effectiveness of Agrikulturang Makamasa Barangay Extension Technicians (AMBETs) is closely linked to their socio-demographic characteristics, which shape their ability to disseminate corn technologies and engage farmers at the barangay level. Globally, scholars have emphasized that age, gender, education, and tenure strongly influence extension workers' adaptability and performance. Ilmarinen (2001) observed that work ability often peaks before age 50, with 15–25% of workers reporting poor work ability by age 55, particularly in physically demanding jobs. This aging trend has implications for extension delivery, especially in rural contexts where physical labor is central.

Gender also plays a critical role. In Mexico, Román-Montes de Oca et al. (2022) reported that 86% of extension workers were men, while Mogues et al. (2009) in Ethiopia highlighted that male dominance limited outreach to women farmers, requiring women's groups to bridge gender-sensitive gaps. Similarly, Ngaka and Zwane (2017) in South Africa underscored the importance of tenure, noting that most extension practitioners had over 20 years of service, which strengthened their advisory capacity. These international findings illustrate how demographic traits intersect with extension effectiveness.

Building on these global insights, Philippine studies reveal parallel patterns. Declaro-Ruedas (2019) found that extension workers in Occidental Mindoro averaged 18 years of experience, equipping them with firsthand knowledge of farmers' problems and management constraints. Lalican et al. (2013) documented that after the devolution of agricultural extension services under the Local Government Code of 1991, LGUs inherited responsibility but often lacked resources to provide stable employment and adequate compensation. Gumban and Baladjay (2025) further highlighted that extension workers in Davao Oriental faced budget shortages and manpower constraints, leading to reliance on incentive-based arrangements rather than permanent staffing.

Compensation emerges as a recurring challenge across contexts. Baah, Anchirinah, and Badu-Yeboah (2009) reported that cocoa extension agents in Ghana were demotivated by irregular pay, while Belay and Abebaw (2004) in Ethiopia found that poor remuneration undermined service delivery. In the Philippines, Delgado and Villacruel (2023) observed that extension workers in Laguna performed well despite low pay, but inadequate incentives remained a barrier. Cidro and Radhakrishna (2020) likewise emphasized that low compensation undermines morale and program sustainability, while Rola, Jamias, and Quizon (2002) noted that LGUs often relied on honoraria and incentives as the main support mechanism for extension services.

Training and professional development are equally decisive. Mamino-Bayot and Ortega Dela Cruz (2025) stressed that competencies are shaped by training frequency, underscoring the need for continuous learning. Briones (2017) added that agricultural workers in the Philippines tend to be older and less educated, with only 2% attaining tertiary education and one-third not finishing primary school. This aging trend and low educational attainment pose challenges for the dissemination of technology, underscoring the importance of ongoing training to enhance effectiveness.

At the barangay level, AMBETs often rely on honorarium-based incentives provided by LGUs, which are irregular and insufficient, affecting motivation and continuity of service delivery (Declaro-Ruedas & Bais, 2019; Manalo et al., 2021). Logistical constraints, such as fuel shortages and a lack of service vehicles, further limit the frequency of farm visits, lectures, and Farmers Field Schools (Gumban & Baladjay, 2025). These challenges reduce consistency and hinder farmer adoption of new technologies. International comparisons reinforce these findings: Umar et al. (2018) in Malaysia reported that younger extension workers with stronger competencies were more effective.

Complementing these insights, Mamino-Bayot and Ortega-Dela Cruz (2025) assessed the functional competency levels of Philippine extension workers and found significant relationships between competencies and socio-demographic factors such as years of service, educational attainment, and experience as focal persons in commodity programs. Taken together, these studies underscore that AMBETs' socio-demographic profile—age, gender, education, tenure, honorarium, and frequency of service delivery—plays a critical role in shaping their effectiveness.

Roles and Responsibilities of AMBETs

Agrikulturang Makamasa Barangay Extension Technicians (AMBETs) are grassroots extension agents who serve as the vital link between government agricultural programs and farmer communities. Their mandate is grounded in the Agriculture and Fisheries Modernization Act (AFMA) of 1997, which authorizes extension services to provide training, farm business advisory services, technology demonstrations, and information dissemination (Carating, Fernando, & Tejada, 2010). Within this framework, initiatives such as the Sustainable Corn Production in Sloping Areas (SCOPSA) deploy AMBETs as frontline workers to promote sustainable corn farming practices in upland areas.

International and local literature consistently highlights the breadth of extension responsibilities. Declaro-Ruedas (2019) documented that extension workers employ farm visits, group meetings, and ICT tools to deliver programs, reinforcing their role as facilitators of farmer learning. Mamino-Bayot and Ortega-Dela Cruz (2025) found that competencies in program management and community mobilization—particularly monitoring and reporting—are central to extension effectiveness. Antwi-Agyei and Stringer (2021) emphasized that extension agents should regularly visit rural farmers to provide improved technologies and services, while Dahlan et al. (2024) underscored the continued importance of face-to-face interactions in sustaining farmer trust and adoption. Similarly, Adamsone-Fiskovica and Grivins (2022) and Norton and Alwang (2020) highlighted participatory approaches and structured farmer engagement as essential for effective extension delivery.

This finding aligns with Chowdhury, Hambly Odame, and Leeuwis (2014), who argued that extension services must evolve beyond routine compliance and reporting to empower farmers as active stakeholders in the agricultural knowledge system. In the Philippine context, Gumban and Baladjay (2025) observed that while AEWs in Davao Oriental were diligent in meeting LGU

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requirements, their effectiveness was constrained by inadequate technical skills and limited capacity for analytical reporting.

Institutional support plays a pivotal role in strengthening AMBETs' responsibilities. The Agricultural Training Institute (ATI), as the extension and training arm of the Department of Agriculture, is mandated to develop training programs, accredit extension workers, and provide continuing education to ensure that grassroots technicians are equipped with updated knowledge and skills (ATI Central Office, n.d.). Through ATI-led capacity-building, AMBETs are trained in technical competencies, communication strategies, and participatory extension approaches, enabling them to effectively deliver services at the barangay level. ATI's involvement ensures that AMBETs' roles are not only operational but also aligned with national extension standards and professional development pathways.

At the community level, AMBETs provide technical support, facilitate technology transfer, and disseminate information on high-quality corn varieties and sustainable practices, thereby improving farmers' access to vital services. As educators, facilitators, and motivators, AMBETs help farmers adopt improved practices, form farmer groups, and increase farm income (Abdullah et al., 2023; Falo, 2022). Teaching materials such as *Ag Ed101: Roles & Functions of Extension Workers* from Western Philippines University emphasize that extension agents act as intervenors in farmers' lives, requiring tact, resourcefulness, and adaptability. Their roles as educators, communicators, facilitators, and advisors highlight the interpersonal dimension of extension work, which is crucial for AMBETs operating at the grassroots level.

Empirical studies reinforce these responsibilities. Mamino-Bayot and Ortega-Dela Cruz (2025) found that extension workers excel in program management, adult learning, and community mobilization, though they are weaker in value chain support and entrepreneurship. Intong and Ravelo (2020) demonstrated that AEWs' organizational commitment and competencies are strongly linked to job performance, underscoring that extension roles are not only technical but also managerial and motivational. Declaro-Ruedas (2019) further documented that AEWs employ farm visits, group meetings, and ICT tools to deliver extension programs, particularly in organic agriculture, reinforcing their role as facilitators of farmer learning.

At the policy level, the Department of Agriculture's Corn Production Enhancement Project (CPEP) guidelines highlight extension workers' role in bridging farmers to improved corn seed varieties, sustainable practices, and feed sufficiency goals, with AMBETs serving as barangay-level implementers. From a broader perspective, Kalirajan (1984) emphasized that farmers' ability to use new technologies effectively is closely tied to extension services, which facilitate the transition from traditional to modern practices. This situates AMBETs as catalysts for change in corn production systems, directly influencing both productivity and farmer livelihoods.

Challenges Faced by AMBETs

Agricultural extension services have long been recognized as key mechanisms for facilitating technology adoption, improving productivity, and sustaining rural development. Yet, across both international and local contexts, extension delivery is often constrained by systemic hurdles, including logistical challenges, financial constraints, political interference, institutional capacity limitations, and socio-cultural factors. Sulaiman and Mittal (2016) emphasized that extension agents require not only sound technical knowledge but also functional communication skills to overcome these barriers. Madan et al. (2022) further highlighted that many extension workers operate with outdated information and lack the technical and communication skills needed to support farmers effectively, largely due to inadequate training and limited access to updated knowledge.

Employment arrangements also shape extension effectiveness. Mangaoang (2021) and Sambo (2018) noted that many government extension workers, including AMBETs, are employed under precarious contracts such as job orders or contracts of service. These insecure arrangements affect job security, benefits, and motivation, ultimately influencing service delivery. Mamino-Bayot and Ortega-Dela Cruz (2025) reinforced this by showing that higher education levels correlate positively with functional capacity, as education equips extension workers with stronger analytical skills and a better grasp of evolving technologies.

Systemic issues are also evident in national policy frameworks. The Philippine Agriculture and Fisheries Extension Strategic Plan 2023–2028 identified funding gaps and political interference as critical barriers to sustainable extension. Ezima et al. (2023) and Fabregas et al. (2022) similarly emphasized that inadequate compensation and unstable support structures reduce motivation among extension workers. Declaro-Ruedas and Bais (2019) and Manalo et al. (2021) documented that honorarium-based incentives and resource shortages undermine extension performance, making financial stability a key determinant of job satisfaction. Raveena et al. (2022) added that insufficient funding and weak infrastructure continue to hamper consistent and impactful service delivery.

Logistical constraints are particularly pronounced. Gumban and Baladjay (2025) identified inadequate fuel allocation, a lack of service vehicles, and expansive coverage areas as critical issues limiting the extension's reach. These findings mirror those in other developing regions, where Kibrom et al. (2025) and Lalican et al. (2013) observed that logistical barriers constrain fieldwork efficiency, especially when farming communities are located far from district centers. In Davao Oriental, Gumban and Baladjay (2025) found that face-to-face interactions, farm visits, lectures, demonstrations, and Farmers Field Schools (FFS) remain the most effective approaches for technology transfer. However, digital technologies such as social media and online platforms are underutilized due to low digital literacy and lack of institutional support. Their study revealed that 58% of AEWs cited mobility issues as their primary challenge, followed by funding constraints (44%) and farmer resistance to change (28%). Santos and Mantillas (2025) added that AEWs usually cover 1–3 barangays with basic capacity levels, reflecting partial implementation of devolved functions. Floranza (2021) pointed to governance-related barriers, such as lack of cooperation from barangay officials, while Declaro-Ruedas (2019) noted that age influences modality—older workers rely more on face-to-face interactions, whereas younger workers adopt ICT-based approaches.

At the national level, challenges are closely tied to the devolution mandated by the Local Government Code of 1991. Ocenar et al. (2008) observed that while the Code facilitated cooperation among LGUs, NGOs, and the private sector, unresolved issues such as weak capacity building, partisan politics, and lack of financial accountability persist.

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Semwenda (2016) noted that decentralized extension services often suffer from a lack of stakeholder participation, delays in funding, and weak accountability, and recommended private-sector involvement and diversified funding sources. Baig and Aldosari (2013) emphasized that extension services in Asia historically struggled with organizational defects, lack of incentives, and inadequate in-service training. Anderson, Feder, and Slade (2004) reinforced this global perspective, noting that despite investments, extension services remain inadequate due to institutional inefficiencies, fiscal unsustainability, and weak linkages with research institutions.

Communication challenges also persist internationally. In Nigeria, Ajani and Onwubuya (2013) found that extension workers used strategies such as folktales, town criers, songs, and dance, alongside demonstrations and radio communication. However, effectiveness was hindered by low incentives, poor communication skills, cultural issues, and farmer illiteracy. Similar challenges were reported in Ethiopia (Workineh et al., 2022), Korea (Kim Jinmo et al., 2009), and Oromia (Geneti & Hailu, 2023), where poor stakeholder engagement, weak research-extension linkages, and reliance on a single extension model limited effectiveness.

METHODOLOGY

This chapter presents the assumptions and rationale for the study locale, research methods, participants, data sources, data-gathering instruments, study procedures, and statistical treatment.

Locale of the Study

The study was conducted in District 2, Province of Davao Oriental, Philippines. Figure 2 shows the province's geographical map, which is part of Region XI and located in Mindanao, particularly in its southeastern portion. The province was bounded on the north by Surigao del Sur and on the southwest by the Davao Gulf. Administratively, Davao Oriental was composed of two districts: District 1, with six municipalities, and District 2, which consisted of four municipalities and one component city—Banaybanay, Lupon, San Isidro, Governor Generoso, and Mati City—where the study was conducted.

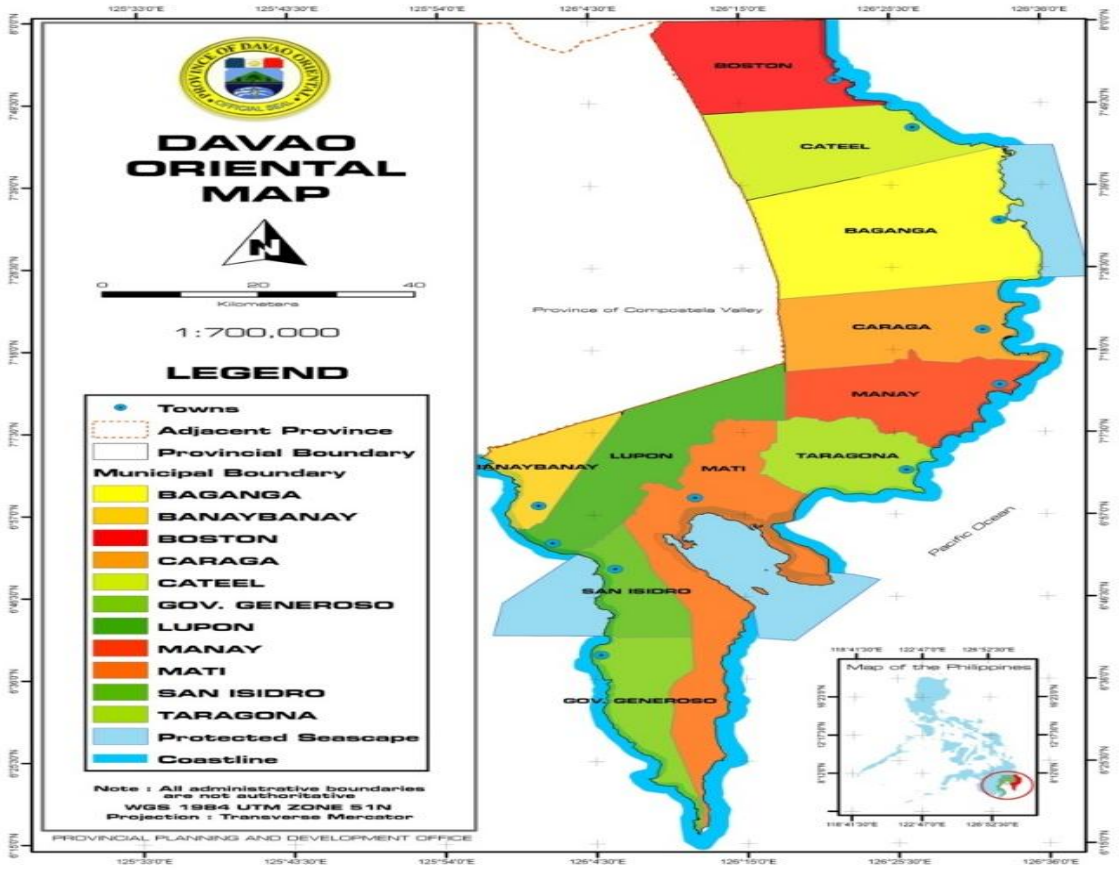

Figure 2. *Geopolitical Map of Davao Oriental Province*

(Provincial Planning and Development Office (PPDO) of Davao Oriental)

Research Design

This study employed a descriptive research method. The descriptive aspect profiled AMBETs in terms of socio-demographic characteristics, roles and responsibilities, and the challenges

Sources of Data

Primary Data were obtained from 57 Agrikulturang Makamasa Barangay Extension Technicians (AMBETs). AMBETs provided information on their socio-demographic profile, roles, responsibilities, and challenges through survey questionnaires.

Secondary Data were gathered from official records of the Provincial Agriculture Office (PAGRO) and municipal agriculture offices, as well as relevant ordinances, resolutions, and published literature on agricultural extension and diffusion of innovations. These sources provided the legal and institutional context for interpreting AMBET performance.

The AMBET sample size of 57 out of 66 was determined using Slovin's formula with a 0.05 margin of error and stratified random sampling to ensure fair representation across municipalities.

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Respondents and Sampling

The AMBET sample size of 57 out of 66 was determined using Slovin's formula. To determine the study's sample size, Slovin's formula was used, with a margin of error of 0.05. This formula is presented here:

Let **(N)** be the population size, and the margin of error (e) denote the allowed probability of committing an error upon selecting a small representative of the population. The formula produces the sample size (n).

$$n = \frac{N}{1 + N.e^2}$$

$$n = \frac{66}{1 + 66(0.05)^2}$$

$$n = \frac{66}{1 + 66(0.0025)}$$

$$n = \frac{66}{1 + 0.165}$$

$$n = \frac{66}{1.165}$$

$$\boldsymbol{n = 56.65\ or\ 57}$$

Figure 2: Slovin Formula of the Sample Population

In addition, the stratified random sampling was used to ensure fair representation across District 2, Davao Oriental. Stratification was based on the municipalities where AMBETs were assigned: San Isidro, Governor Generoso, Lupon, Banaybanay, and Mati City. Respondents within each stratum were proportionally allocated and randomly selected by draw lots from barangays actively engaged in corn production.

Table 1: Research participants' distribution in District 2, Davao Oriental

City/ Municipality	Total Number of AMBETs (Corn)	Sample Size	Share of Total Sample (%)
Mati City	21	18	31%
San Isidro	11	9	16%
Governor Generoso	17	15	28%
Lupon	12	10	18%
Banaybanay	5	4	7%
Total	**66**	**57**	**100%**

Source: Provincial Agriculture Office – Corn Program Database

Table 1 shows the distribution of 66 Agrikulturang Makamasa Barangay Extension Technicians (AMBETs) actively engaged in corn production, of whom 56 were selected as participants across District 2, Davao Oriental, which includes four municipalities and one city: San Isidro, Governor Generoso, Lupon, and Banaybanay, and Mati City.

Research Methods

This study used descriptive design and quantitative approaches to determine the Socio-Demographic Profile, Roles, and Challenges of Agrikulturang Makamasa Barangay Extension Technicians (AMBETs) in Corn Technology Extension Services. Quantitative data were collected through a self-developed survey administered to 57 AMBETs. The instrument consisted of three parts: socio-demographic profile, roles and responsibilities, and challenges faced. To ensure accuracy and consistency, the questionnaire underwent expert validation by three specialists in agricultural extension and research methodology, followed by pilot testing with 15 AMBETs from District 1, Davao Oriental. Reliability was assessed using Cronbach's Alpha, which confirmed the items' internal consistency.

Data Gathering Procedure

The study was conducted in District 2 of Davao Oriental to determine the Socio-Demographic Profile, Roles, and Challenges of Agrikulturang Makamasa Barangay Extension Technicians (AMBETs) in Corn Technology Extension. A descriptive design was employed, with quantitative approaches. From the total population of 66 AMBETs, a sample of 57 was determined using Slovin's formula with a 0.05 margin of error. Stratified random sampling ensured proportional representation across the five municipalities of San Isidro, Governor Generoso, Lupon, Banaybanay, and Mati City.

Coordination was first established with the Provincial Agriculture Office (PAGRO) to facilitate access to respondents. Quantitative data were then gathered through a self-developed questionnaire administered to AMBETs.

Statistical Treatment

Data analysis in this study employed both quantitative and qualitative approaches to provide a comprehensive evaluation of AMBETs' effectiveness in disseminating corn technologies. For the quantitative component, survey responses from AMBETs were analyzed using descriptive statistics—frequency counts, percentages, means, and standard deviations—to summarize socio-demographic profiles, roles and responsibilities, perceived effectiveness, and challenges. These measures ensured the accuracy and reliability of the results.

RESULTS AND DISCUSSIONS

This chapter presents the study's findings. The first part showed the socio-demographic profile of AMBETs. The second part outlined the roles and responsibilities of AMBETs. Afterward, the third part reported the challenges AMBET faced in delivering corn extension services.

Socio-demographic Profile of AMBETs

Age

The age distribution of AMBET respondents shows that the largest group is those aged 55 or older, accounting for 45.61% of the workforce. This indicates that nearly half of the extensionists are senior and experienced, but as noted by Ilmarinen (2001), workers' ability to perform often peaks before age 50, and by age 55, about 15–25% report poor work ability, particularly in physically demanding jobs. For this reason, ages 45–50 years are commonly used as the baseline criterion for defining an "aging worker. In contrast, the smallest group is those under 25 years old, accounting for only 3.51%. Very few young individuals are appointed as AMBET.

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Table 3: Frequency Distribution of Respondents' Age

Age	Frequency	Percentage
Below 25	2	3.51
25 – 34	3	5.26
35 – 44	11	19.30
45 – 54	15	26.32
Above 55	26	45.61
Total	57	100

Gender

The gender distribution of AMBET respondents shows that the largest group is male, accounting for 64.91% of the workforce. In supported with the international findings: in Mexico, Román-Montes de Oca et al. (2022) reported that 86% of extension workers were men, while in Ethiopia, Mogues et al. (2009) identified the predominance of male extension agents as a barrier to reaching women farmers, noting that women's groups were needed to address the socially sensitive issue of male agents providing advice to women one-on-one. In contrast, the smallest group among AMBET respondents were those who preferred not to disclose their gender, representing only 3.51% of the sample. This minimal proportion suggests that nearly all participants were comfortable identifying their gender, with only a few opting for privacy.

Table 4: Frequency Distribution of Respondents' Gender

Gender	Frequency	Percentage
Male	37	64.91
Female	18	31.58
Prefer not to say	2	3.51
Total	57	100

Civil Status

The civil status distribution of AMBET respondents shows that the majority are married (78.95%), reflecting the family-oriented nature of rural agricultural workers who balance household responsibilities with extension duties. This predominance suggests that AMBETs are deeply embedded in their communities, strengthening trust and credibility in their roles. Consistent with this, the FAO (2022) highlighted that rural livelihoods in the Philippines are strongly tied to household and family structures, with family labor serving as the backbone of agricultural production and extension services.

Table 5: Frequency Distribution of Respondents' Civil Status

Civil Status	Frequency	Percentage
Single	9	15.79
Married	45	78.95
Widow	3	5.26
Total	57	100

Educational Attainment

The educational attainment of AMBET respondents shows that the largest group is high school graduates (54.39%), indicating that most extension workers have basic literacy and technical skills but limited access to advanced training. In contrast, the smallest group is college graduates (5.26%), reflecting the low proportion of extensionists with tertiary education. This finding is consistent with Briones (2017), who reported that agricultural workers in the Philippines tend to be older and less educated, with only 2% attaining tertiary education and one-third not finishing primary school.

Table 6: Frequency Distribution of Respondents' Educational Attainment

Educational Attainment	Frequency	Percentage
Elementary Level	5	8.77
High School Graduate	31	54.39
Vocational/Technical	5	8.77
College Level	13	22.81
College Graduate	3	5.26
Total	57	100

Years of Experience as an AMBET

Nearly half of the respondents reported 7 years or more of experience (47.37%), showing a strong presence of seasoned AMBETs who bring institutional knowledge and long-term engagement in extension work. In contrast, only 7.02% have less than a year of experience, reflecting ongoing recruitment and integration of new personnel.

This pattern supports the findings of Ngaka and Zwane (2017), who noted that the majority of extension practitioners in South Africa had over 20 years of extensive work experience, underscoring the importance of tenure in ensuring effective agricultural extension and advisory services.

Table 7: Frequency Distribution of Respondents on Years of Experience as an AMBET

Years of Experience as an AMBET	Frequency	Percentage
Less than a year	4	7.02
1 – 3 years	20	35.09
4 – 6 years	6	10.53
7 years or more	27	47.37
Total	57	100

Years of Experience working especially on corn technology

The data show that the majority of AMBET technicians in District 2 have seven years or more of experience in corn technology (47.37%), while the smallest group are those with less than a year of experience (7.02%). The predominance of highly experienced technicians is consistent with Declaro-Ruedas (2019), who reported that extension workers in Occidental Mindoro had an average of 18 years of extension experience, equipping them with a firsthand understanding of farmers' problems and management constraints.

Table 8: Frequency Distribution of Respondents on Years of Experience working especially on corn technology

Years of Experience working especially on corn technology	Frequency	Percentage

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Less than a year	4	7.02
1 – 3 years	20	35.09
4 – 6 years	6	10.53
7 years or more	27	47.37
Total	57	100

Current Employment status as an AMBET

The data show that 100% of AMBET respondents are employed on an honorarium or incentive-based arrangement, indicating a uniform compensation structure across the program. This reflects the common practice in Philippine agricultural extension systems, where many local government units (LGUs) and community-based programs engage extension workers through non-permanent, performance-based contracts. Such arrangements, while providing flexibility for LGUs, often result in limited job security and inconsistent benefits for extension workers.

This finding aligns with Lalican et al. (2013), who documented that after the devolution of agricultural extension services under the Local Government Code of 1991, LGUs inherited responsibility for extension delivery but often lacked sufficient resources to provide stable employment and adequate compensation. Similarly, Gumban and Baladjay (2025) highlighted that extension workers in Davao Oriental faced constraints due to limited local budgets and manpower shortages, underscoring the reliance on incentive-based arrangements rather than permanent staffing.

Table 9: Frequency Distribution of Respondents on Employment Status as an AMBET

Employment Status as an AMBET	Frequency	Percentage
Honorarium/Incentive Based	57	100
Contract of Service	0	0
Job Order	0	0
Volunteer	0	0
Permanent/Regular	0	0
Total	57	100

Payment Frequency

The data reveal that all AMBET respondents (100%) receive their honorarium or incentive-based compensation on a quarterly basis, reflecting a standardized payment system across the program. This uniformity ensures predictability and consistency in financial support, which is important for program management and accountability. However, while quarterly disbursements provide structure, they may also pose challenges for extension workers who depend on more frequent income to meet household needs, especially given the financial vulnerability of rural households.

International studies also highlight the implications of incentive-based compensation. Baah, Anchirinah, and Badu-Yeboah (2009) found that cocoa extension agents in Ghana were often demotivated by irregular or insufficient compensation, which affected their ability to reach farming communities. Likewise, Belay and Abebaw (2004) reported that extension agents in Ethiopia faced systemic challenges, including poor remuneration, which undermined their motivation and service delivery.

Table 10: Frequency Distribution of Respondents on Payment Frequency

Payment Frequency	Frequency	Percentage
Monthly	57	100
Quarterly	0	0
Annually	0	0
Per Task/Project-based	0	0
Total	57	100

Salary range

The income distribution of AMBET respondents shows that the largest group (77.19%) earns between ₱1000 and ₱3000, underscoring the modest honoraria received by extension workers. In contrast, the smallest group (1.75%) falls within the ₱3001–₱5000 bracket, highlighting the limited opportunities for higher compensation. This finding is consistent with Delgado and Villacruel (2023), who reported that agricultural extension workers in Laguna performed well despite low pay but identified inadequate financial incentives as a barrier. Similarly, Cidro and Radhakrishna (2020) emphasized that while extension services in the Philippines are critical for technology transfer, low compensation often undermines worker morale and limits program sustainability.

Table 11: Frequency Distribution of Respondents on Payment Salary Range per month

Salary Range	Frequency	Percentage
Below 1000	5	8.77
1000 – 3000	44	77.19
3001 – 5000	1	1.75
5001 – 7000	7	12.28
Total	57	100

Sources of Incentives

The data show that 91% of AMBET respondents receive incentives from a combination of PLGU, LGU, and BLGU, while only 9% rely solely on PLGU and LGU. This indicates that local government units serve as the primary providers of honorarium and incentive-based support, underscoring the decentralized nature of agricultural extension financing in the Philippines. This finding is consistent with Rola, Jamias, and Quizon (2002), who often compensated through local government honoraria and incentives, reflecting the reliance on LGUs as the main support mechanism for extension services.

Table 12: Frequency Distribution of Respondents on Sources of Incentives

Sources of Incentives	Frequency	Percentage
PLGU,LGU,BLGU	52	91.23
PLGU,LGU	5	8.77
DA	0	0
Private Sectors	0	0

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NGO's	0	0
Total	57	100

Training Attended

The distribution of AMBET respondents shows that the largest group (36.84%) attended only 1–2 training sessions in the past 3 years, while the smallest group (3.51%) attended more than 10. This indicates that while some capacity-building opportunities are available, most extension workers remain undertrained, which may affect their effectiveness in service delivery. This finding is consistent with Mamino Bayot and Ortega Dela Cruz (2025), who emphasized that extension workers' competencies are significantly shaped by training frequency and professional development, underscoring the need for continuous learning to strengthen extension effectiveness.

Table 13: Frequency Distribution of Respondents on Training Attended

Training Attended	Frequency	Percentage
None	16	28.07
1 – 2	21	36.84
3 – 5	14	24.56
6 – 10	4	7.02
More than 10	2	3.51
Total	57	100

Roles and responsibilities performed by AMBETs

Monitoring and Reporting Roles of AMBETs

Survey results clearly show that AMBETs are highly effective in monitoring and reporting, with the highest mean score recorded for documenting damages caused by natural calamities (M = 4.47, *Strongly Agree*) and an overall weighted mean of 4.36 (*Strongly Agree*).

Moreover, the literature supports this conclusion. Declaro-(2019) documented that extension workers employ farm visits, group meetings, and systematic reporting to deliver programs, while Mamino Bayot and Ortega Dela Cruz (2025) found that competencies in program management and community mobilization—both tied to monitoring and reporting—are central to extension effectiveness.

Table 14. Level of Agreement on Monitoring and Reporting of Roles of AMBETs

Statement	**Mean**	**Level of Agreement**
Monitor and report outbreaks of insect pests and crop diseases	4.40	Strongly Agree
Report damages caused by natural calamities	4.47	Strongly Agree
Submit reports on agricultural projects implemented by agencies	4.37	Strongly Agree
Report animal bites and rabies cases to the appropriate LGU offices	4.19	Agree
Conduct and submit profiling reports of farmers and fisherfolk	4.35	Strongly Agree
Collect and document agricultural data at the barangay level	4.40	Strongly Agree
Overall Weighted Mean	4.36	Strongly Agree

Extension and Training of Roles of AMBETs

Survey results revealed that AMBETs are effective in their extension and training roles, with the highest mean score recorded for conducting farm visits, farmers' classes, and training sessions (M = 4.33, *Strongly Agree*) and an overall weighted mean of 4.23 (*Strongly Agree*). This quantitative evidence highlights their strong performance in farmer engagement and knowledge transfer. The literature supports this conclusion. Declaro-Ruedas (2019) documented that extension workers use farm visits, group meetings, and ICT tools to deliver programs, reinforcing their role as facilitators of farmer learning. Additionally, Antwi-Agyei and Stringer (2021) emphasized that extension agents should regularly visit rural farmers to provide improved technologies and services, while Dahlan et al. (2024) highlighted the continued importance of face-to-face interactions in sustaining farmer trust and adoption. Previous studies by Adamsone-Fiskovica and Grivins (2022) and Norton and Alwang (2020) further underscore the importance of participatory approaches and structured farmer engagement for effective extension delivery.

Table 15. Level of Agreement on Extension and Training of Roles of AMBETs

Statement	**Mean**	**Level of Agreement**
Provide direct assistance to farmers	4.28	Strongly Agree
Conduct farm visits, farmers' classes, and training sessions	4.33	Strongly Agree
Disseminate agricultural and fisheries program information	4.25	Strongly Agree
Promote good agricultural and aquaculture practices	4.30	Strongly Agree
Assist in animal health services and rabies vaccination programs	4.12	Agree
Serve as a focal person for disaster animal preparedness	4.11	Agree
Overall Weighted Mean	4.23	Strongly Agree

Community Engagement of Roles of AMBETs

Survey data showed a moderate mean score of 4.05 (*Agree*) for community engagement. This finding is added in farmer testimonies, where engagement is often informal and relational rather than structured.

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The literature supports this conclusion. Mamino Bayot and Ortega Dela Cruz (2025) found that extension workers excel in community mobilization but are weaker in value chain support and organizational leadership. This aligns with the present findings, where AMBETs are effective in building rapport and facilitating communication but depend on higher offices for structured organizing and decision-making.

Table 16. Level of Agreement on Community Engagement of Roles of AMBETs

Statement	**Mean**	**Level of Agreement**
Assist in organizing community initiatives and stakeholder collaboration	4.05	Agree

Administrative Duties of AMBETs

Survey data revealed very high agreement scores for administrative responsibilities, with an overall weighted mean of 4.35 (*Strongly Agree*), showing that AMBETs are highly consistent in complying with LGU requirements such as submitting reports, attending meetings, and coordinating with barangay offices. This finding aligns with Chowdhury, Hambly Odame, and Leeuwis (2014), who emphasized that extension services must evolve beyond routine compliance and reporting to empower farmers as active stakeholders in the agricultural knowledge system. In the Philippine context, Gumban and Baladjay (2025) observed that while AEWs in Davao Oriental were diligent in meeting LGU requirements, their effectiveness was constrained by inadequate technical skills and limited capacity for analytical reporting.

Table 17. Level of Agreement on Administrative Duties of AMBETs

Statement	Mean	Level of Agreement
Submit monthly work plans and accomplishment reports.	4.47	Strongly Agree
Report to the Barangay Hall every Monday	4.30	Strongly Agree
Attend monthly meetings called by LGU offices.	4.51	Strongly Agree
Perform other assigned functions as required by higher authorities	4.44	Strongly Agree
Overall Weighted Mean	4.35	Strongly Agree

Challenges Faced by AMBETs

Resource and Logistical Constraints

Survey data revealed that AMBETs face moderate challenges in resource and logistical support, with inadequate infrastructure emerging as the most significant barrier (M = 3.44, *Significant*) and an overall weighted mean of 3.25 (*Moderate*). Farmers echoed this reality, noting that AMBETs often struggle to reach remote sitios because of limited mobility and resources:

These findings are consistent with the literature, noting that extension workers continue to struggle with systemic issues such as insufficient funding and weak infrastructure, which hamper their ability to provide consistent and impactful services (Raveena et al., 2022). Such challenges mirror findings in other developing regions, where logistical barriers constrain fieldwork efficiency and service reach (Kibrom et al., 2025; Lalican et al., 2013).

Table 19. Challenges Faced by AMBETs in Resource and Logistical Constraints

Statement	Mean	Extent of Challenge
Do not have sufficient resources to effectively deliver corn technology to farmers	3.25	Moderate
Unable to perform my duties due to a lack of material or logistical support	3.05	Moderate
Inadequate infrastructure prevents the delivery of services efficiently	3.44	Significant
Overall Weighted Mean	3.25	Moderate

Farmer Receptiveness

Survey data revealed moderate challenges in farmer receptiveness, with the highest mean score recorded for barangays in remote locations (M = 3.28, *Moderate*), highlighting geographic barriers as the most pressing issue. The lowest mean score was for farmers not always receptive to adopting new corn technologies (M = 2.96, *Moderate*), suggesting that while resistance exists, it is less critical than accessibility.

With the related findings supporting, Gumban and Baladjay (2025) identified mobility and logistical constraints—such as inadequate fuel allocation, a lack of service vehicles, and expansive coverage areas—as critical issues limiting the extension's reach. Similarly, studies in other developing regions confirm that logistical barriers constrain fieldwork efficiency and service reach, particularly when farming communities are located far from district centers and extension agents lack transport (Kibrom et al., 2025; Lalican et al., 2013).

Table 20. Challenges Faced by AMBETs in Farmer Receptiveness

Statement	Mean	Extent of Challenge
Farmers in my area are not always receptive to adopting new corn technologies	2.96	Moderate
Farmer resistance hinders the implementation of extension programs.	3.00	Moderate
Remote location of some barangays makes it difficult to reach farmers consistently	3.28	Moderate
Overall Weighted Mean	3.08	Moderate

Job Satisfaction and Motivation

Survey data revealed moderate challenges in job satisfaction and motivation, with the highest mean score recorded for salary not being commensurate with the work (M = 3.25, *Moderate*) and an overall weighted mean of 2.85 (*Moderate*). This indicates that compensation is the most pressing factor affecting motivation.

These findings are consistent with the Philippine Agriculture and Fisheries Extension Strategic Plan 2023–2028, which highlights systemic issues such as funding gaps and political interference as

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critical barriers to sustainable extension. Previous studies also support this conclusion: Ezima et al. (2023) and Fabregas et al. (2022) emphasized that inadequate compensation and unstable support structures reduce motivation among extension workers. Similarly, Declaro-Ruedas & Bais (2019) and Manalo et al. (2021) documented that honorarium-based incentives and resource shortages undermine extension performance, making financial stability a key determinant of job satisfaction.

Table 21. Challenges Faced by AMBETs in Job Satisfaction and Motivation

Statement	Mean	Extent of Challenge
Do not always feel satisfied with my current role and responsibilities as an AMBET	2.51	Minor
Often feel unappreciated and unsupported	2.81	Moderate
Current salary is not commensurate with the work	3.25	Moderate
Insufficient compensation negatively affects motivation and job performance.	2.81	Moderate
Overall Weighted Mean	2.85	Moderate

Communication and Knowledge Gaps

Survey data revealed minor challenges in communication and knowledge gap, with AMBETs generally confident in engaging farmers (M = 2.16, *Minor*) and only moderate concern about technical knowledge in corn production support (M = 3.02, *Moderate*). The finding roughly agreed with that of Sulaiman & Mittal (2016), who suggested that agricultural extension agents need both sound technical knowledge relevant to crops and enterprises in the specific context and functional communication skills. The results confirm that AMBETs are strong communicators and trusted intermediaries, effectively bridging farmers and local government programs. However, their technical knowledge in corn production requires further strengthening.

Table 22. Challenges Faced by AMBETs in Communication and Knowledge Gaps

Statement	Mean	Extent of Challenge
Not always confident in the ability to communicate effectively with farmers	2.16	Minor
Communication barriers impede the success of extension work	2.53	Minor
Does not feel adequately equipped with the technical knowledge needed for corn production support.	3.02	Moderate
Overall Weighted Mean	2.57	Minor

Training and Educational Background

Survey data revealed moderate challenges in training and educational preparation, with the highest mean score recorded for lack of sufficient training to improve skills in delivering corn technology (M = 3.23, *Moderate*) and an overall weighted mean of 2.83 (*Moderate*).

Corn coordinators reinforced this by stressing that AMBETs are effective in facilitating technology adoption but need regular updates to stay aligned with evolving practices. Moreover, the study by Madan et al. (2022) highlighted that many extension workers operate with outdated information and lack the technical and communication skills needed to support farmers effectively, largely due to inadequate training and limited access to updated knowledge. On the other hand, this claim was supported by Mamino Bayot & Ortega Dela Cruz (2025), who stated that numerous studies confirm the positive correlation between the level of education attained by extension workers and their functional capacity. Higher education provides stronger knowledge, analytical skills, and a better understanding of evolving agricultural technologies

Table 23. Challenges Faced by AMBETs in Training and Educational Background

Statement	Mean	Extent of Challenge
Lack of sufficient training to improve skills in delivering corn technology	3.23	Moderate
Educational background does not fully prepare for A role as an AMBET	2.47	Minor
Performance would benefit from higher qualifications	2.72	Moderate
Have not attended enough training sessions to stay updated on corn technologies	3.07	Moderate
The training received has not significantly improved the ability to support farmers	2.70	Moderate
Overall Weighted Mean	2.83	Moderate

SUMMARY, CONCLUSION AND RECOMMENDATION

The study revealed that Agrikulturang Makamasa Barangay Extension Technicians (AMBETs) in District 2, Davao Oriental are predominantly aged 55 and above (45.61%), male (64.91%), and married (78.95%), reflecting an experienced but aging workforce deeply rooted in their communities. Most are high school graduates (54.39%), with only 5.26% college graduates, indicating modest educational attainment. Nearly half (47.37%) have seven or more years of experience in both general extension work and corn technology, underscoring their long-term engagement and institutional knowledge.

All AMBETs are employed under honorarium or incentive-based arrangements, earning ₱1,000–₱3,000 per month, which is released quarterly. This payment structure ensures predictability but limits financial flexibility, often affecting motivation and household stability. Incentives are primarily sourced from PLGU, LGU, and BLGU (91%), while training opportunities remain limited—36.84% attended only one to two sessions in three years, and 28.07% had none, highlighting the need for continuous capacity building.

In their roles, AMBETs perform strongly in monitoring and reporting (WM = 4.36) and administrative duties (WM = 4.35), consistently fulfilling LGU requirements. They are also effective in

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extension and training (WM = 4.23), particularly through farm visits and farmer classes. However, community engagement (WM = 4.05) is moderately effective, often informal and relational rather than structured.

Challenges include resource and logistical constraints (WM = 3.25), farmer receptiveness (WM = 3.08), and job satisfaction/motivation (WM = 2.85)—with low and infrequent compensation emerging as the most pressing issue. Minor issues were noted in communication and knowledge gaps (WM = 2.57), while training and educational background (WM = 2.83) remain moderate barriers to effectiveness.

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