

The Benefits Derived by the Farmers in the Implementation of the Agricultural Extension Services of the Department of Agriculture (DA) in Rinconada District, Province of Camarines Sur

Sally R. Buenaagua¹

¹School of Graduate Studies, University of Northeastern Philippines

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ABSTRACT

Agricultural extension services play a crucial role in promoting sustainable rice production and ensuring food and cultural security in local farming communities. This study examined the benefits derived from the implementation of the agricultural extension services of the Department of Agriculture (DA) in Rinconada District, Province of Camarines Sur, for Calendar Year 2024. Specifically, it determined the extent of implementation of extension services in fostering production sustainability across food security, socio-economic, environmental, and financial dimensions; assessed the significant differences in rank orders of implementation between agricultural extension workers and farmer beneficiaries; evaluated the benefits derived by farmers in terms of income, household well-being, education, social, and health outcomes; and examined the significant differences in the perceived benefits between the two respondent groups. The study employed a descriptive–evaluative–inferential research design. The respondents consisted of fifteen (15) agricultural extension workers and twenty-one (21) farmer beneficiaries in Rinconada District. Data were collected using a researcher-developed questionnaire structured on a five-point rating scale. Statistical tools utilized included weighted mean, frequency count, percentage, rank, and the Wilcoxon Mann–Whitney U-Test, with the level of significance set at 0.05. These methods enabled a systematic assessment of both the extent of program implementation and the multidimensional benefits perceived by stakeholders. Findings revealed that agricultural extension services were very much implemented across all sustainability dimensions, with food security obtaining the highest overall rating, followed by socio-economic, environmental, and financial factors. No statistically significant differences were found in the rank orders of implementation between extension workers and farmer beneficiaries ($p > 0.05$). Similarly, the benefits derived from the implementation were very much evident in terms of education, social, health, and income outcomes, while household well-being was rated as much evident. No significant differences were observed in the rank orders of perceived benefits between the two groups ($p > 0.05$). The results affirm the effectiveness of agricultural extension services in promoting production sustainability and enhancing farmer welfare, while underscoring the need for strengthened outreach, financial literacy initiatives, inclusive policies, and integrated support systems to sustain long-term agricultural development.

1. Introduction

Agricultural extension services play a pivotal role in advancing rural development, strengthening food systems, and promoting sustainable agricultural production. In rice-producing regions such as the Rinconada District of Camarines Sur, extension programs serve as the primary mechanism through which government agencies translate agricultural policies into actionable support for farmers. These services encompass technical training, access to improved seed varieties, climate-resilient farming methods, pest and nutrient management, market linkage facilitation, and financial assistance mechanisms. Beyond increasing productivity, agricultural extension initiatives are expected to enhance food security, preserve cultural farming traditions, and promote long-term production sustainability.

The Philippine agricultural sector continues to face persistent challenges including climate variability, fluctuating market prices, environmental degradation, limited access to capital, and socio-economic disparities among farming communities. In response, the Department of Agriculture (DA) has implemented extension programs designed to foster sustainable rice production systems that integrate traditional knowledge with modern technologies. These programs aim not only to improve yield and economic returns but also to strengthen environmental stewardship, financial resilience, and community-based agricultural networks. Within this framework, agricultural extension services are positioned as instruments of inclusive growth and rural transformation.

Production sustainability in rice farming requires a multidimensional approach. Food security must be ensured through improved productivity and efficient distribution systems; socio-economic development must address employment, cooperative strengthening, and equitable resource access; environmental sustainability must promote eco-friendly pest management, soil conservation, and renewable resource utilization; and financial mechanisms must provide farmers with credit access, subsidies, and risk management strategies. Effective extension services are therefore evaluated not solely by output increases but by their broader contributions to farmer welfare and community resilience.

While numerous policy initiatives highlight the importance of agricultural extension services, empirical assessments of their implementation and the tangible benefits derived by farmers remain essential for evidence-based governance. Specifically, it is necessary to determine whether extension services are implemented consistently across sustainability dimensions and whether both implementers and beneficiaries perceive similar outcomes. Furthermore, assessing the multidimensional benefits—income, household well-being, education, social cohesion, and health—provides a more comprehensive understanding of extension impacts beyond economic productivity alone.

In the context of Rinconada District, Province of Camarines Sur, rice farming remains a critical economic and cultural activity. However, systematic evaluation of the extent of implementation of DA extension services and the benefits derived by farmer beneficiaries has been limited. The absence of localized empirical evidence creates a gap in understanding how effectively extension programs translate policy intentions into measurable sustainability and welfare outcomes.

Thus, this study examines the benefits derived from the implementation of the agricultural extension services of the Department of Agriculture in Rinconada District for Calendar Year 2024. Specifically, it determines the extent of implementation of extension services across food security, socio-economic, environmental, and financial dimensions; assesses the significant differences in perceptions between agricultural extension workers and farmer beneficiaries; evaluates the benefits derived by farmers in terms of income, household well-being, education, social, and health; and formulates policy recommendations based on the findings. By generating empirical evidence grounded in local agricultural realities, the study contributes to strengthening agricultural governance, promoting sustainable rice production, and enhancing farmer welfare within the framework of inclusive rural development.

2. Methodology

This study employed a descriptive–evaluative–inferential research design to determine the benefits derived from the implementation of the agricultural extension services of the Department of Agriculture (DA) in Rinconada District, Province of Camarines Sur, for Calendar Year 2024. The descriptive component was used to assess the extent of implementation of agricultural extension services in fostering production sustainability for food and cultural security of rice across four dimensions: food security, socio-economic, environmental, and financial factors. The evaluative component examined the benefits derived by farmers in terms of income, household well-being, education, social, and health outcomes. The inferential component tested the significant differences in the rank orders of the extent of implementation and the perceived benefits between agricultural extension workers and farmer beneficiaries.

The study was conducted in the Rinconada District, Province of Camarines Sur, a major rice-producing area where agricultural extension services are actively implemented. The respondents consisted of fifteen (15) agricultural extension workers and twenty-one (21) farmer beneficiaries, for a total of thirty-six (36) participants. The respondents were selected based on their direct involvement in the implementation and receipt of agricultural extension services. Agricultural extension workers represented the implementing group, while farmer beneficiaries represented the receiving group, enabling comparative analysis of perceptions regarding implementation and benefits.

A researcher-developed questionnaire served as the primary data-gathering instrument. The instrument was structured into two major sections: (1) extent of implementation of agricultural extension services to foster production sustainability along food security, socio-economic, environmental, and financial dimensions; and (2) benefits derived by farmers in terms of income, household well-being, education, social, and health outcomes. A five-point rating scale was used to measure responses, with corresponding verbal interpretations ranging from lowest to highest levels of implementation and evidential benefits. The questionnaire underwent content validation to ensure clarity, relevance, and alignment with the objectives of the study prior to its administration.

Data collection was conducted upon securing permission from the concerned authorities and respondents. The questionnaires were personally administered to ensure accurate completion and retrieval. Ethical considerations such as voluntary participation, confidentiality of responses, and the exclusive use of data for research purposes were strictly observed throughout the study.

The data gathered were analyzed using both descriptive and inferential statistical tools. Frequency count and percentage were used to describe respondent distribution. The weighted mean was utilized to determine the extent of implementation and the level of benefits derived. Ranking was employed to establish the order of indicators within each dimension. To determine the significant differences in the rank orders between the two groups of respondents, the Wilcoxon Mann–Whitney U-Test was applied. All tests of significance were conducted at the 0.05 level of significance, and decisions regarding the null hypotheses were based on the computed z-values and corresponding probability levels.

3. Results and Discussions

3.1 Extent of the Implementation of Agricultural Extension Services to Foster Production Sustainability

The findings revealed that the agricultural extension services of the Department of Agriculture (DA) in Rinconada District were very much implemented across all four sustainability dimensions: food security, socio-economic, environmental, and

financial factors. The consistently high weighted mean values (ranging from 4.80 to 4.88) indicate strong institutional performance and systematic program delivery.

Table 1: Summary of the Extent of Implementation of Agricultural Extension Services

Dimension	Weighted Mean	Verbal Interpretation
Food Security	4.88	Very Much Implemented
Socio-Economic	4.85	Very Much Implemented
Environmental	4.83	Very Much Implemented
Financial Factors	4.80	Very Much Implemented

Food security obtained the highest overall rating (WM = 4.88), indicating that extension services effectively support rice production sustainability through integration of traditional and modern farming practices, climate-resilient strategies, soil fertility management, irrigation guidance, and strengthened market linkages. Analytically, this suggests that the extension framework successfully aligns productivity enhancement with cultural preservation and long-term food security objectives. The integration of market access initiatives further strengthens farmers' economic resilience while minimizing post-harvest losses.

The socio-economic dimension (WM = 4.85) also demonstrated strong implementation. Programs promoting mechanization, digital agriculture, cooperative formation, financial access, and rural employment opportunities contributed to improved livelihoods. This reflects a multidimensional approach in which extension services extend beyond technical assistance to broader rural development strategies.

Environmental sustainability (WM = 4.83) findings indicate consistent promotion of eco-friendly pest management, reduced tillage, methane control, renewable energy use, biodiversity integration, and waste recycling practices. The strong environmental ratings demonstrate that sustainability principles are embedded within rice production systems, reinforcing long-term ecological resilience.

Financial factors (WM = 4.80) also received a "Very Much Implemented" rating, highlighting effective financial support mechanisms such as microloans, subsidies, cooperative resource pooling, infrastructure investment, and financial literacy training. Although slightly lower than other dimensions, the high rating reflects institutional efforts to mitigate market volatility and strengthen farmers' financial security.

3.2 Test of Significant Difference on the Rank Orders of Implementation

To determine whether there was a significant difference in perceptions between agricultural extension workers and farmer beneficiaries regarding the extent of implementation, the Wilcoxon Mann-Whitney U-Test was applied.

Table 2: Test of Significant Difference on the Rank Orders of the Extent of Implementation

Dimension	Computed z	p-value	Decision on H ₀	Interpretation
Food Security	0.26	0.3974	Accepted	Not Significant
Socio-Economic	0.37	0.3557	Accepted	Not Significant
Environmental	0.18	0.4286	Accepted	Not Significant
Financial Factors	0.64	0.2611	Accepted	Not Significant

Since all p-values were greater than 0.05, the null hypothesis was accepted. This indicates no statistically significant difference between extension workers and farmers regarding the rank orders of implementation. Analytically, this consensus suggests strong alignment between program delivery and beneficiary perception, implying effective communication, transparency, and mutual understanding of extension services. Such congruence enhances institutional credibility and strengthens stakeholder trust.

3.3 Benefits Derived by Farmers from the Implementation of Agricultural Extension Services

The findings further revealed that the benefits derived from the implementation of agricultural extension services were predominantly very much evident, particularly in education, social, health, and income domains.

Table 3: Summary of the Benefits Derived by Farmers

Benefit Dimension	Weighted Mean	Verbal Interpretation
Education	4.60	Very Much Evident
Social	4.60	Very Much Evident
Health	4.59	Very Much Evident
Income	4.52	Very Much Evident
Household Well-Being	3.71	Much Evident

Education (WM = 4.60) emerged as one of the highest-rated benefits, reflecting enhanced knowledge in climate adaptation, financial planning, digital agriculture, cooperative management, and policy participation. This indicates that extension services function as knowledge-transfer platforms that strengthen human capital and decision-making capacity among farmers.

Similarly, social benefits (WM = 4.60) were very much evident, demonstrating strengthened cooperative networks, collective problem-solving, peer learning, and increased farmer participation in governance. These outcomes enhance social cohesion and community resilience, which are critical components of sustainable rural development.

Health benefits (WM = 4.59) included improved stress management, reduced pesticide exposure, safer equipment handling, and better nutrition awareness. Analytically, this suggests that extension services contribute not only to economic outcomes but also to improved quality of life and occupational safety.

Income (WM = 4.52) benefits reflect strengthened cooperative networks, improved market access, post-harvest handling, financial literacy, and diversification of income sources. These findings confirm that extension services positively influence financial stability and long-term economic sustainability.

Household well-being (WM = 3.71), while rated slightly lower as “Much Evident,” still demonstrates notable improvements in financial security, food stability, and household resilience. The relatively lower rating suggests that while individual farmer benefits are strong, broader household-level impacts may require deeper integration of family-centered interventions.

3.4 Test of Significant Difference on the Rank Orders of Benefits

Table 4: Test of Significant Difference on the Rank Orders of Benefits Derived

Benefit Dimension	Computed z	p-value	Decision on H ₀	Interpretation
Income	1.28	0.1003	Accepted	Not Significant
Household Well-Being	1.28	0.1003	Accepted	Not Significant
Education	0.60	0.2748	Accepted	Not Significant
Social	0.19	0.4247	Accepted	Not Significant
Health	0.30	0.3821	Accepted	Not Significant

All p-values exceeded the 0.05 level of significance; hence, the null hypothesis was accepted. There is no statistically significant difference in the perceptions of extension workers and farmers regarding the benefits derived from agricultural extension services. This uniformity of perception reinforces the credibility of reported outcomes and suggests that both implementers and beneficiaries recognize the tangible impacts of extension interventions.

Overall, the results demonstrate that agricultural extension services in Rinconada District are systematically implemented and generate multidimensional benefits across production sustainability and farmer welfare domains. The absence of significant differences between respondent groups indicates institutional coherence, transparency, and effective stakeholder engagement. The highest-rated outcomes in food security, education, and social resilience highlight the transformative potential of extension services beyond technical farming assistance. However, the relatively lower rating in household well-being suggests the need for deeper integration of household-centered development strategies.

Collectively, the findings affirm that agricultural extension services function not merely as productivity-enhancing mechanisms but as comprehensive rural development interventions that strengthen economic stability, environmental stewardship, human capital, and community resilience.

4. Conclusions and Implications

4.1 Conclusions

This study concludes that the agricultural extension services of the Department of Agriculture (DA) in Rinconada District, Province of Camarines Sur, are very much implemented in fostering production sustainability for food and cultural security of rice. Across the four core dimensions—food security, socio-economic, environmental, and financial factors—the consistently high weighted mean values reflect a robust and systematically delivered extension framework. Food security emerged as the most strongly implemented dimension, indicating that extension services effectively integrate traditional rice farming practices with modern technologies to sustain productivity while preserving cultural heritage.

The findings further establish that there is no statistically significant difference between agricultural extension workers and farmer beneficiaries regarding the rank orders of the extent of implementation. This consensus suggests strong alignment between policy execution and beneficiary experience, reinforcing institutional credibility and stakeholder trust. The coherence in perception indicates that extension programs are implemented transparently and are effectively communicated to the farming communities.

Moreover, the benefits derived from the implementation of agricultural extension services were found to be very much evident, particularly in the areas of education, social development, health, and income. Educational and social benefits were most prominent, highlighting the transformative role of extension services in strengthening knowledge systems, cooperative networks, and participatory governance. Health-related gains further demonstrate that extension interventions contribute to improved occupational safety, nutrition awareness, and overall well-being. While household well-being was rated slightly lower as “much evident,” the overall results confirm that extension services extend beyond productivity gains to multidimensional rural development outcomes.

Finally, no statistically significant difference was observed in the rank orders of benefits derived between extension workers and farmer beneficiaries. This uniformity in perception affirms that both implementers and recipients recognize the tangible impacts of agricultural extension programs. Collectively, the findings validate the effectiveness of extension services as instruments of production sustainability, community resilience, and farmer welfare enhancement.

4.2 Implications

The findings of this study have significant implications for agricultural governance, policy development, program implementation, and future research.

At the policy level, the strong implementation ratings across sustainability dimensions suggest that current extension frameworks are aligned with national agricultural development goals. Policymakers should therefore sustain and institutionalize integrated approaches that simultaneously address food security, environmental stewardship, socio-economic development, and financial resilience. Given the high ratings in education and social domains, agricultural extension should continue to function as a knowledge-transfer and community-building mechanism rather than merely a technical support service.

From a programmatic perspective, the absence of significant differences between implementers and beneficiaries indicates effective stakeholder engagement. However, the relatively lower rating in household well-being implies the need to expand extension programs toward more household-centered interventions. Integrating financial literacy, family resilience training, health education, and nutrition-focused initiatives may further strengthen the broader socio-economic impact of extension services.

In terms of financial sustainability, the findings highlight the importance of strengthening cooperative systems, improving access to credit and subsidies, and enhancing market linkages. Expanding digital trading platforms, regional market hubs, and performance-based incentives for extension workers may improve efficiency and long-term viability. Targeted support for marginalized farmers, youth participants, and women-led enterprises is likewise essential to promote inclusivity and equitable resource distribution.

Institutionally, the results underscore the importance of continuous monitoring and evaluation frameworks. Although implementation is rated highly, structured impact assessments and longitudinal tracking of farmer outcomes can provide deeper insights into long-term sustainability and equity dimensions.

For future research, comparative analyses across districts or regions may determine whether similar levels of implementation and benefit are observed in varying socio-economic contexts. Longitudinal studies examining long-term economic and health impacts, as well as investigations into gender-responsive and youth-inclusive agricultural extension models, would further enrich evidence-based policymaking.

In sum, the study affirms that agricultural extension services in Rinconada District are not only effectively implemented but also generate substantial and multidimensional benefits for farmers. Sustained institutional support, inclusive policy enhancement, and strengthened financial and educational interventions are essential to ensure that these gains are maintained and further amplified in pursuit of resilient and sustainable rice production systems.

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