Perceived Effectiveness of Farmers' Information and Technology Services' (FITS) Communication Strategy in San Pablo City, Laguna: Basis for a Proposed Training Design

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Abstract

This study evaluated the effectiveness of the communication strategies of the Farmers' Information and Technology Services (FITS) in San Pablo City, Laguna, and developed a training design to address identified gaps. Using a descriptive–correlational design, data were collected from 192 rice farmers selected through stratified random sampling and analyzed using descriptive and inferential statistics. Results showed that FITS communication strategies were perceived as Highly Effective, with Engagement and Responsiveness to Concerns receiving the highest rating (M = 3.91, SD = 0.26) and Accessibility of Communication Channels the lowest (M = 3.72, SD = 0.40). No significant differences were found in perceived effectiveness when respondents were grouped by demographic profile. However, limited training opportunities on the use of ICT tools emerged as the most significant challenge. This study's original contribution lies in demonstrating that high perceived communication effectiveness can coexist with persistent capacity-building gaps, particularly in ICT skills, and in translating empirical findings into a context-specific training design for FITS personnel. The findings underscore the need for systematic ICT and communication training across FITS centers and have practical implications for strengthening agricultural extension services nationwide by promoting inclusive, responsive, and digitally capable communication strategies.

Keywords: *Communication Strategy, FITS San Pablo, Rice Farmers, Training Design, Weaknesses and Challenges*

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Introduction

The Farmers' Information and Technology Services (FITS) represents a strategic pillar of the Philippine agricultural extension system under the Agricultural Training Institute, mandated to facilitate the dissemination of timely, relevant, and actionable agricultural information through an integrated blend of traditional and information and communication technology (ICT)-mediated channels. Anchored in foundational communication theories, particularly the Shannon–Weaver Model and Diffusion of Innovations Theory, the effectiveness of agricultural communication is contingent upon message clarity, strategic channel selection, feedback integration, and sustained audience engagement to minimize informational noise and optimize innovation uptake. Within this theoretical architecture, FITS operates as a critical knowledge intermediary, translating complex agricultural technologies into contextually intelligible formats and delivering these through channels aligned with farmers' socio-cognitive capacities and local realities.

Recent empirical literature underscores the transformative role of ICT-enabled communication in enhancing agricultural productivity by broadening access to information and enabling interactive, multi-directional knowledge exchange between farmers and extension agents. Nevertheless, the efficacy of digital communication remains constrained when information is overly technical, poorly contextualized, or disseminated through platforms that are inaccessible or misaligned with users' technological readiness.

Such limitations contribute to cognitive overload, message distortion, and suboptimal adoption outcomes. In alignment with communication effectiveness frameworks, key determinants of successful information utilization include message relevance and clarity, accessibility and appropriateness of communication channels, timeliness of dissemination, and the presence of responsive feedback mechanisms. While ICT integration has progressively shifted extension paradigms toward participatory and dialogic models, conventional communication pathways—such as extension personnel, farmer leaders, and interpersonal networks—continue to play an indispensable role in fostering trust, reinforcing comprehension, and sustaining behavioral change.

Despite these advancements, a persistent disjunction remains between agricultural communication policy frameworks and their operationalization at the field level. Structural constraints, including top-down dissemination approaches, limited ICT capacity-building initiatives, and infrastructural inadequacies, continue to impede meaningful farmer engagement and the equitable adoption of agricultural innovations—particularly among aging and resource-constrained populations. Furthermore, socio-demographic variables may significantly mediate farmers' perceptions of communication effectiveness and their propensity to adopt recommended practices. Against this backdrop, a systematic evaluation of FITS communication strategies is imperative. This study critically examines the communication practices of FITS San Pablo in the dissemination of rice production information to farmers in San Pablo City, assessing perceived effectiveness across core communication dimensions, identifying implementation challenges, and analyzing demographic differentials. The findings inform the development of a context-responsive training framework aimed at strengthening institutional communication competencies and advancing inclusive, evidence-based agricultural extension services.

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Methodology

This study employed a descriptive–correlational research design to examine the relationships among variables pertaining to the effectiveness of communication strategies implemented by the Farmers' Information and Technology Services (FITS). Descriptive–correlational designs are appropriate for identifying patterns of association without inferring causal relationships, thereby enabling a systematic analysis of observable phenomena within natural settings. This approach is widely utilized in the social sciences to generate empirically grounded insights into behavioral and institutional dynamics, serving as a foundation for subsequent explanatory or experimental inquiries (Creswell & Creswell, 2018).

The respondents comprised registered rice farmers in San Pablo City. From a total population of 382 farmers, a sample size of 192 respondents was determined using a 95% confidence level and a 5% margin of error. To ensure representativeness across heterogeneous farming contexts, stratified random sampling was employed.

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The population was stratified according to barangay location to account for variations in agricultural practices, access to extension services, and farm characteristics. Proportionate allocation was applied to determine the number of respondents per stratum, followed by simple random sampling within each group. This procedure minimized sampling bias and enhanced the external validity and generalizability of the findings to the broader rice farming population in the study area.

Data were collected using a researcher-developed survey questionnaire administered through a pen-and-paper approach. The instrument consisted of 24 indicators measured on a 4-point Likert scale (4 = Strongly Agree to 1 = Strongly Disagree), intentionally excluding a neutral midpoint to elicit more definitive responses.

Content validity was established through expert evaluation involving specialists in agriculture, research methodology, and language. Using the Content Validity Index (CVI), the instrument achieved an overall score of 0.92, indicating excellent validity following iterative revisions.

A pilot test was conducted among 30 rice farmers from FITS Center, Tiaong, Quezon (excluded from the main sample). Reliability analysis using Cronbach's alpha yielded an overall coefficient of 0.87, with subscale values ranging from 0.79 to 0.90, demonstrating satisfactory to high internal consistency. All identified refinements were incorporated prior to full-scale data collection.

Prior to data collection, formal permission was secured from the relevant agricultural authorities and the FITS office in San Pablo. Coordination with the City Agriculturist and barangay officials ensured institutional support and facilitated access to respondents. Data collection was conducted across the FITS Center and eight selected barangays within San Pablo City. Respondents were approached in coordination with local officials, and questionnaires were administered directly to eligible rice farmers. Data collection continued until the target sample size of 192 respondents was achieved. Completed questionnaires were subsequently encoded and organized in a secure database for analysis.

This study was conducted in accordance with established ethical principles governing research involving human participants, ensuring respect for persons, beneficence, and justice throughout the research process. Prior to data collection, informed consent was obtained from all respondents. Participants were provided with a clear and comprehensive explanation of the study's purpose, procedures, duration, and any potential risks or benefits. They were also informed of their right to decline participation or withdraw from the study at any point without any form of penalty or disadvantage.

Confidentiality and anonymity were strictly upheld. No personally identifiable information was collected, and each respondent was assigned a unique code to ensure privacy during data processing and analysis. All collected data were used solely for academic and research purposes. Hard-copy questionnaires were securely stored in a locked facility, while electronic data were maintained in password-protected files accessible only to the researchers.

Participation in the study was entirely voluntary, and no form of coercion or undue influence was exercised. To further safeguard participants' rights, the study ensured that all procedures were conducted in a manner that minimized potential harm and maximized the integrity and credibility of the research process. Data will be securely retained for a period of five (5) years following publication and will be permanently disposed of thereafter in accordance with standard data management protocols.

The data gathered in this study were analyzed using both descriptive and inferential statistical techniques in accordance with the research objectives. Descriptive statistics, including frequency and percentage, were employed to summarize the demographic profile of the respondents. To assess the perceived effectiveness of the communication strategies implemented by the Farmers' Information and Technology Services (FITS), the weighted mean and standard deviation were computed, providing measures of central tendency and variability. Inferential statistical analyses were conducted to determine significant differences in perceptions across selected demographic variables; specifically, the independent samples t-test was used for dichotomous variables, while one-way analysis of variance (ANOVA) was applied for variables with more than two groups.

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Furthermore, to identify and prioritize the challenges encountered by respondents in relation to FITS communication strategies, frequency, percentage, and ranking procedures were utilized. All statistical tests were performed at an appropriate level of significance to ensure the reliability and validity of the findings.

Results and Discussion

The age distribution of rice farmers in San Pablo City indicates a predominance of older individuals, with those aged 61–70 years comprising the largest proportion (n = 63, 32.81%). In contrast, younger farmers aged 21–30 years represent the smallest group (n = 2, 1.04%). This pattern reflects the aging demographic structure of the agricultural workforce, a trend widely documented in the literature. Empirical evidence suggests that the average age of rice farmers typically falls within the middle to older age brackets, indicating limited generational renewal in the sector (Alabi et al., 2023). The minimal participation of younger individuals may be attributed to shifting occupational preferences, as younger populations increasingly pursue urban-based employment opportunities perceived to offer higher economic returns and greater stability (World Bank, 2020).

In terms of sex distribution, the findings reveal a marked predominance of male respondents, accounting for 72.92% (n = 140) of the sample, while female farmers constitute 27.08% (n = 52). This distribution underscores the continued male dominance in rice farming activities, particularly in decision-making and labor-intensive field operations. However, this does not diminish the critical role of women in agricultural systems. Women are actively engaged in post-harvest processes and support functions that contribute significantly to the overall sustainability of rice production systems. Such gendered division of labor aligns with national agricultural data, which highlight the complementary roles of men and women in farming communities (Philippine Statistics Authority, 2020).

With respect to farming experience, the largest proportion of respondents reported 11–20 years of experience (n = 59, 30.73%), indicating a workforce characterized by moderate to extensive exposure to rice farming practices. Conversely, only a small fraction reported more than 50 years of experience (n = 3, 1.56%).

These findings suggest that the majority of farmers possess substantial experiential knowledge, which is essential for navigating the complexities of agricultural production, including climatic variability and market fluctuations. Prior studies affirm that farming experience serves as a critical determinant of adaptive capacity and productivity, particularly in the context of risk management and sustainable agricultural practices (Cervantes et al., 2015; Department of Agriculture, 2023).

Table 1. Demographic Profile of Rice Farmer Respondents in San Pablo City

Variable	Category	f	Percentage
Age Group	21-30 years old	2	1.04
	31-40 years old	17	8.85
	41-50 years old	41	21.35
	51-60 years old	52	27.08
	61-70 years old	63	32.81
	>70 years old	17	8.85
Sex	Male	140	72.92
	Female	52	27.08
Years of Experience as a Rice Farmer	1-5 years	19	9.90
	6-10 years	26	13.54
	11-15 years	22	11.46
	16-20 years	37	19.27
	21-25 years	6	3.13
	26-30 years	21	10.94
	31-35 years	11	5.73
	36-40 years	25	13.02
	41-45 years	12	6.25
	46-50 years	10	5.21
	> 50 years	3	1.56
Educational Attainment	Elementary	70	36.46
	High School	80	41.67
	College	42	21.88

The distribution of respondents according to educational attainment reveals that the majority of rice farmers have completed secondary education, with 41.67% (n = 80) reporting high school completion. In contrast, only 21.88% (n = 42) attained collegiate-level education, representing the smallest proportion among the categories. These findings suggest that while most farmers possess basic formal education, relatively few have pursued higher or specialized academic training. Educational attainment is a critical factor influencing farmers' capacity to access, interpret, and adopt emerging agricultural technologies and practices.

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Existing literature indicates that Filipino rice farmers are generally literate, with most having completed at least elementary or secondary education; however, participation in tertiary education, particularly in agriculture-related fields, remains limited. Consistent with this, Flor Palis (2020) reported that the average educational attainment of rice farmers is approximately eight years, equivalent to the secondary level. This educational profile underscores the need for targeted, context-responsive capacity-building initiatives to enhance farmers' technical competencies and support the effective adoption of modern agricultural innovations, as emphasized by Philippine Rice Research Institute (2022).

Table 2 presents the perceived effectiveness of the communication strategies implemented by the Farmers' Information and Technology Services (FITS) in San Pablo City. Among the assessed indicators, Engagement and Responsiveness to Concerns obtained the highest mean score (M = 3.91, SD = 0.26), interpreted as Highly Effective. This finding indicates that FITS has effectively established interactive and responsive communication mechanisms that facilitate the timely exchange of information and address farmers' concerns. From a theoretical standpoint, this aligns with dialogic and participatory communication frameworks, which emphasize the importance of two-way communication in enhancing trust, message credibility, and behavioral adoption. Empirical evidence supports this observation, as responsive communication channels have been shown to strengthen stakeholder engagement and improve the overall effectiveness of agricultural extension systems (Holmes & Wilson, 2022).

Table 2. Summary Table of the Perceived Effectiveness of the Communication Strategies

Indicators	Mean	SD	VI
Relevance and clarity of the message	3.84	0.21	Highly Effective
Accessibility of communication channels	3.72	0.40	Highly Effective
Timeliness of information dissemination	3.77	0.36	Highly Effective
Engagement and responsiveness to concerns	3.91	0.26	Highly Effective
OVERALL	3.81	0.24	Highly Effective

N=192; Legend: 3.26-4.00 Highly Effective; 2.51-3.25 Effective; 1.76- 2.50 Not Effective; 1.00-1.75 Highly Not Effective

Conversely, Accessibility of Communication Channels registered the lowest mean score (M = 3.72, SD = 0.40), although it remained within the Highly Effective range. This suggests that while a variety of communication platforms—such as face-to-face meetings, printed materials, mobile messaging, social media, and audiovisual content—are utilized, certain barriers to access may still persist. These constraints may be attributed to variations in digital literacy, technological infrastructure, and platform familiarity among farmers. Existing literature on agricultural communication similarly highlights that accessibility challenges often arise in rural contexts, where disparities in connectivity and resource availability can limit the reach and utilization of ICT-based extension services (Khan et al., 2024). From the perspective of the Shannon–Weaver Model, such limitations may introduce "noise" within the communication process, thereby affecting message transmission and reception. This underscores the necessity of aligning communication channels with the socio-technical capacities of target audiences to ensure effective information delivery.

Overall, the communication strategies yielded a composite mean of 3.81 (SD = 0.24), interpreted as Highly Effective, indicating that FITS San Pablo demonstrates strong performance in delivering relevant, timely, and engaging agricultural information. Nonetheless, the relatively lower rating in accessibility highlights the need for further enhancement of communication inclusivity. Strengthening accessibility alongside engagement is critical to ensuring equitable dissemination of information across diverse farmer groups. This finding reinforces established principles in agricultural extension research, which assert that sustained communication effectiveness is achieved through the integration of participatory engagement and inclusive access to information resources.

Table 3 presents the results of the inferential analysis examining differences in the perceived effectiveness of FITS communication strategies when respondents were grouped according to sex, age, years of farming experience, and educational attainment. The statistical tests revealed no significant differences across all demographic variables ($p > .05$), indicating that respondents' perceptions of communication effectiveness were statistically comparable regardless of their demographic characteristics. This suggests a high level of consistency in how FITS communication strategies are experienced among rice farmers in San Pablo City.

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Table 3. Test of Difference in the Perceived Level of Effectiveness of Communication Strategies When Grouped According to Demographic Profile

		Mean	SD	t	p-value	VI
Sex	Male	3.81	0.24	0.34	0.73	NS
	Female	3.80	0.26			
		Mean	**SD**	**F**	**p-value**	**VI**
Age Group	21-30 years old	3.76	0.34	1.56	0.17	NS
	31-40 years old	3.84	0.16			
	41-50 years old	3.84	0.17			
	51-60 years old	3.83	0.24			
	61-70 years old	3.80	0.25			
	>70 years old	3.67	0.37			
Years of Experience as a Rice Farmer	1-5 years	3.83	0.16	0.67	0.75	NS
	6-10 years	3.87	0.16			
	11-15 years	3.79	0.30			
	16-20 years	3.78	0.25			
	21-25 years	3.88	0.08			
	26-30 years	3.81	0.22			
	31-35 years	3.74	0.37			
	36-40 years	3.78	0.28			
	41-45 years	3.92	0.08			
	46-50 years	3.79	0.36			
	> 50 years	3.77	0.14			
Educational Attainment	Elementary	3.79	0.27	0.48	0.62	NS
	High School	3.83	0.21			
	College	3.81	0.24			

This finding diverges from earlier studies which posit that socio-demographic factors significantly influence individuals' perceptions of and engagement with agricultural communication systems (Kuttschreuter et al., 2014; Msoffe & Ngulube, 2016). The absence of statistically significant variation in the present study may be attributed to the standardized yet inclusive design of FITS communication strategies. By utilizing a combination of traditional and ICT-based platforms—such as face-to-face interactions, printed materials, mobile messaging, and social media—FITS appears to have effectively addressed variability in access, literacy, and technological readiness among farmers.

From a theoretical perspective, this outcome aligns with principles of communication and technology adoption, which suggest that when information systems are accessible, user-oriented, and reinforced through repeated exposure and interpersonal support, the influence of demographic variables on perception and adoption tends to diminish. In particular, the Diffusion of Innovations Theory posits that widespread adoption is facilitated when innovations are perceived as compatible, simple, and observable within a social system—conditions that appear to be met in the FITS communication framework.

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From a practical standpoint, the findings imply that FITS may not need to implement highly segmented or demographic-specific communication strategies. Instead, sustaining a multi-channel, integrated communication approach remains a viable and effective strategy for reaching a heterogeneous farming population. This is consistent with findings from ICT-for-agriculture research, which demonstrate that once communication technologies become familiar, contextually relevant, and supported by extension agents, disparities in perception and utilization across demographic groups tend to diminish (Khan et al., 2024).

Overall, the results underscore the equity and inclusivity of FITS communication strategies, highlighting their capacity to deliver agricultural information effectively across diverse farmer profiles. This reinforces the importance of designing extension communication systems that prioritize accessibility, consistency, and user-centered delivery to achieve broad-based impact.

Table 4 presents the key challenges encountered by rice farmers in accessing and utilizing agricultural information delivered through the Farmers' Information and Technology Services (FITS) in San Pablo City. Among the identified constraints, limited training opportunities on the use of ICT tools emerged as the most frequently reported challenge, cited by 50.52% of the respondents. This finding indicates that, despite the overall high effectiveness ratings of FITS communication strategies, there remains a significant gap in capacity-building initiatives aimed at enhancing farmers' digital competencies. It suggests that favorable perceptions of communication effectiveness may coexist with underlying limitations in ICT-related skills, which could restrict the optimal utilization of digital communication platforms. This observation is consistent with prior studies indicating that insufficient ICT training and awareness continue to impede the adoption of modern agricultural information systems (Sigdel et al., 2022).

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Table 4. Frequency of Responses on the Weaknesses and Challenges Encountered from FITS San Pablo

Statements	Frequency	Percentage	Rank
Poor Communication System (e.g., Lack of Internet Access to Gain Information or Instructions Through Social Media)	89	46.35	2nd
Vague Messages Sent Through Text or Chat	49	25.52	6th
Complexity of ICT Tools	83	42.71	3rd
Low Complexity	21	25.30	
Medium Complexity	45	54.22	
High Complexity	17	20.48	
Insufficiency of FITS Training for the Enhancement of Rice Farmers' Knowledge and Practical Skills.	53	27.60	4th
Limited Training Opportunities for Rice Farmers on the Use of ICT Tools	97	50.52	1st
Difficulty in Interpreting Technical Information Sent Through Messages	44	22.92	7th
Insufficient Information or Instructions about Rice Planting	50	26.04	5th
Direct Seedling	45	23.44	
Transplanting	40	20.83	
Pre-Planting Activities	39	20.31	
Cultivation Methods	40	20.83	
Rice Cultivation Areas	40	20.83	
Harvesting	40	20.83	
The process from Rice Seed to Milled Rice	40	20.83	

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Other prominent challenges included poor communication infrastructure, particularly limited internet access (46.35%), and the perceived complexity of ICT tools (42.71%). These findings underscore the presence of structural and technological barriers that constrain effective information dissemination in rural agricultural settings. The results further imply that the high effectiveness ratings reported in earlier sections may be largely supported by traditional, interpersonal communication channels rather than by ICT-based modalities alone. Such patterns are commonly observed in rural extension systems, where face-to-face interactions and community networks remain critical in bridging information gaps.

In contrast, difficulty in interpreting technical information registered the lowest frequency (22.92%), suggesting that most respondents perceive the communicated content as generally understandable. However, this result warrants cautious interpretation, as self-reported measures of comprehension may not fully capture actual levels of understanding or application. Existing literature highlights the tendency of respondents to overestimate their comprehension, particularly in contexts involving technical or specialized information (Banerjee et al., 2023).

Overall, the findings reveal a nuanced dynamic wherein FITS communication strategies are perceived as effective, yet persistent challenges related to ICT training, infrastructure, and usability continue to limit their full impact. Addressing these constraints through targeted capacity-building programs and improved digital infrastructure is essential to bridging the gap between perceived effectiveness and actual information utilization. Strengthening these areas will enhance not only access to agricultural knowledge but also the capacity of farmers to adopt and sustain innovation in an increasingly digital agricultural landscape.

In response to the identified gaps in communication accessibility, ICT-related competencies, and digital literacy among extension personnel, this study proposes the SAGANA (Sustaining Agricultural Growth and Nurturing Advancement) Training Program as a context-responsive capacity-building intervention for FITS staff. The program is grounded in an outcomes-based training design framework, integrating principles from adult learning theory and experiential learning to ensure relevance, learner engagement, and immediate workplace application. By aligning training content with the actual challenges encountered by rice farmers, the program aims to enhance the ability of FITS personnel to deliver clear, accessible, and technology-enabled agricultural communication across diverse farming contexts.

The training is designed as a structured four-day program, with each day organized around specific competency-based learning objectives. Day 1 focuses on strengthening foundational competencies in agricultural extension, including an in-depth understanding of FITS services, core principles of effective communication, and audience-centered message design. Day 2 emphasizes the development of ICT competencies, particularly the practical use of mobile technologies, social media platforms, and digital tools for disseminating agricultural information. Day 3 centers on the application of agricultural technologies and the translation of technical knowledge into simplified, farmer-friendly communication formats to enhance comprehension and usability. Day 4 highlights leadership development, sustainability practices, and strategic planning to foster long-term farmer engagement and sustained adoption of agricultural innovations.

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A combination of learner-centered pedagogical approaches will be employed, including focused lectures, guided workshops, live demonstrations, collaborative group discussions, and hands-on activities. These strategies are supported by multimodal instructional resources such as training manuals, digital devices, printed reference materials, and audiovisual aids, ensuring alignment with diverse learning preferences and field-based application.

To evaluate the effectiveness of the training program, multiple assessment strategies will be implemented, including pre- and post-training assessments, performance-based skill demonstrations, and structured participant feedback mechanisms. These evaluation components are intended to measure both knowledge acquisition and practical competency development. By enhancing communication proficiency, ICT integration, and leadership capacity, the SAGANA Training Program directly addresses the disconnect between high perceived communication effectiveness and the persistent ICT-related challenges identified in this study. Ultimately, the program seeks to strengthen extension service delivery, improve farmer engagement, and contribute to more inclusive and sustainable agricultural development outcomes.

Conclusions and Recommendations

Rice farming in San Pablo City is predominantly undertaken by older, male farmers with substantial farming experience and generally basic to secondary-level educational attainment. Despite these demographic characteristics, the communication strategies implemented by the Farmers' Information and Technology Services (FITS) are perceived as highly effective in terms of message clarity, relevance, timeliness, and responsiveness. Moreover, the absence of significant differences in perceived effectiveness across demographic groups suggests that FITS has successfully implemented an inclusive and standardized communication approach that resonates with a heterogeneous farming population. However, the findings also reveal that high perceived effectiveness coexists with persistent structural and capacity-related constraints, particularly in terms of limited ICT training, restricted access to communication platforms, and the complexity of digital tools. These challenges indicate that while traditional and interpersonal communication channels remain strong, the full potential of ICT-enabled extension services has yet to be realized.

In light of these findings, it is recommended that FITS sustain its current multi-channel communication strategies while introducing targeted refinements to enhance accessibility and usability, particularly in ICT-based platforms. Emphasis should be placed on simplifying technical information through clear, concise language and the integration of visual and demonstration-based approaches to improve comprehension across varying literacy and experience levels. Furthermore, the implementation of the SAGANA (Sustaining Agricultural Growth and Nurturing Advancement) Training Program is strongly advocated to address gaps in digital literacy and strengthen farmers' capacity to engage with technology-supported communication systems. Continuous monitoring mechanisms, such as periodic field-based assessments and feedback systems, should also be institutionalized to ensure responsiveness and ongoing improvement. Collectively, these measures will enhance the effectiveness, inclusivity, and sustainability of agricultural communication, ultimately supporting improved farmer engagement, innovation adoption, and productivity.

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