Daagu International Journal of Basic and Applied Research 8(1) (2026): 936-958
doi: 10.20372/dijbar312.v8i1.2026

Research Article

Assessing the impact of radio programs on farmers' agricultural development in Tigray region, Ethiopia

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Received: April 17, 2024 *Revised: March 02, 2026* *Accepted: June 11, 2026*

Abstract

This study investigates how farmers in the Abreha We-Atsbeha community in the Tigray Region, Ethiopia, view Dimtsi Weyane Tigray's (DWET) agricultural radio program, "Geteratna," and its contribution to agricultural growth. A survey of 121 farm families was combined with focus groups and key informant interviews with media and agricultural stakeholders as part of a mixed-methods methodology. Descriptive statistics (frequencies and percentages) were used to analyze quantitative data, whereas thematic analysis was used to analyze qualitative data. The findings demonstrate that radio remains a significant source of agricultural information in the research area: 95.9% of respondents reported listening to DWET, and the majority of listeners found the show's content applicable and useful. Content on seasonal agronomic advice, market information, and effective local practices was the most valued by respondents. A sizable percentage (84.4%) said they continued to implement the recommended procedures and applied the program's instructions. However, there were few opportunities for engagement and feedback, with the majority of farmers stating that they hardly ever participate in program planning or provide input to the station. The study concludes that "Geteratna" serves as a valuable supplementary channel for extension services; nevertheless, more participatory forms, systematic audience feedback, and tighter synchronization with regional production schedules would increase its growth potential.

Keywords: Geteratna program, Agricultural radio, Farmers' perspectives, Agricultural information sharing, Participatory communication

1. INTRODUCTION

Radio education in rural communities mainly aids the adoption of innovative agricultural technologies, enhancing yields and challenging the traditional perception of low productivity. This is evident in the widespread adoption of new technologies by diverse groups of farmers. To increase revenue, farmers are encouraged to adopt advanced methods, which require behavioral change (Khanal, 2011). As one of the oldest communication media, radio plays a significant role in disseminating information, education, and entertainment, and remains vital for community engagement and empowerment (Nattimba, 2004).

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Sakda (1984) asserts that radio provides villages with direct guidance and specialized educational programs, supporting the adoption of new techniques and innovations in both domestic and agricultural contexts. By expanding access to education, radio reduces the influence of traditional elites who previously controlled educational opportunities.

Ethiopian agriculture is predominantly defined by rain-fed, low-input, low-output, and subsistence farming practices (Zerssa et al. 2021). Despite the efforts of government agricultural extension agents to promote modern, intensive farming methods in Ethiopia's Tigray region, adoption of new organic fertilizers and higher-quality seeds remains limited. Low agricultural productivity in the region is primarily attributed to smallholder farmers' inadequate access to agricultural inputs, financial services, advanced production technologies, irrigation, and markets. Additionally, unsatisfactory land administration practices contribute to significant risks of land degradation.

Radio remains a major source of information in Ethiopia despite ongoing challenges in media access and infrastructure. UNESCO (2022) reported that Ethiopia had 76 radio stations serving a population of more than 110 million people, highlighting the continued importance of radio for information dissemination and development communication.

The importance of agricultural information for farm production remains a central concern for rural development stakeholders. The growing presence of radio sets and stations in developing countries suggests radio can significantly influence rural development (Odira, 2014).

Rural populations in low-income countries depend heavily on rain-fed agriculture and natural resources. This makes them very vulnerable to climate variability and change. Droughts, such as the 2015-2016 El Niño, have caused acute food insecurity and increased need for humanitarian assistance in Ethiopia (FAO, 2017; WFP, 2017). Providing rural farmers with relevant agricultural information is essential for better production decisions, increased market participation, and access to new technologies. In resource-limited settings, radio remains an effective tool for sharing this information (Odira, 2014).

Despite some successes, agricultural restoration in the region remains inconsistent. In Ethiopia's Tigray Regional State, Abreha We-Atsbeha is recognized as the most successful village in desertification rehabilitation. Two decades ago, the community's farmlands were considered wasteland due to prolonged degradation. In recent years, agricultural livelihoods have suffered from erratic weather and repeated crop failures, making migration the community's principal source of income (UNDP, 2013). The community faced potential relocation due to desertification, soil degradation, and water scarcity. However, with support from Dimtsi

Weyane Tigray (DWET) and the local agricultural radio program 'Geteratna,' the community reclaimed its land through reforestation and sustainable management of over 224,000 hectares of forest. Tree planting has led to increased agricultural yields, improved soil quality, enhanced groundwater function, and flood mitigation (UNDP, 2013). Although positive feedback and program assessments are available, there is a lack of empirical data at the community level regarding farm families' perceptions of DWET's agricultural program, 'Geteratna,' and their application of its guidance.

This study evaluates farmers' perceptions of the program and its impact on agricultural development in the Abreha We-Atsbeha community. For clarity, 'Geteratna' is the program's official title and is translated into English as an extension-oriented agricultural radio show. The study aims to: (i) assess farmers' access to and listening patterns for DWET and 'Geteratna'; (ii) identify the types of agricultural information most valued by farmers; (iii) investigate the extent to which listeners report applying the information; and (iv) document opportunities to enhance participation and feedback mechanisms. Given Ethiopia's high illiteracy rate and the predominance of farming among its population, radio has become the most widely used mass medium to support development initiatives across various regions (Jemal, 2013).

However, previous studies have focused on the national level and have not addressed the micro-level context of radio use. These studies have also relied exclusively on secondary data, which does not fully capture the importance of radio in promoting agricultural growth. Consequently, this conceptual and methodological gap highlights the need to examine the role of DWET radio in advancing agricultural development in the Abreha We-Atsbeha community in Tigray.

1.1. Theoretical Foundations:

This study builds upon communication-for-development scholarship, which conceptualizes media as a resource for information exchange, discourse, and collaborative problem-solving. As the present research examines farmers' perspectives and self-reported use of program material, rather than experimental effects, the theoretical framework is applied to evaluate how and why an agricultural radio program may contribute to agricultural development outcomes.

1.2. Communication for participation

Participatory communication emphasizes the active involvement of people affected by development issues through dialogue, shared learning, and collective problem-solving. Drawing on Freire’s (1970) concept of dialogic communication, this approach views information exchange as a two-way process that promotes critical reflection and action. In agricultural communication, participatory principles recognize farmers not only as recipients of technical information but also as valuable sources of knowledge, contributing indigenous

practices, local innovations, and practical insights. Radio-based interactive formats such as call-in programs, listener letters, community reporters, and farmer-to-farmer testimonies encourage participation and enhance the relevance, credibility, and ownership of agricultural information. Complementing this perspective, diffusion of innovations theory explains how new ideas and practices spread within a social system. While mass media play a crucial role in creating awareness and providing information, interpersonal interactions and personal experiences are often more influential in shaping attitudes and adoption decisions (Rogers & Shoemaker, 1971). Accordingly, listening to "Geteratna," perceiving its content as useful, and applying the information in practice are considered key mechanisms through which radio can promote learning and behavioral change.

Development media theory further highlights the role of media in developing countries as instruments for education, social transformation, and development support (McQuail, 1987). This perspective underscores the importance of delivering frequent and locally relevant agricultural programming that complements extension services and improves farmers' understanding of innovations, market opportunities, and production risks such as weather variability and pest outbreaks. In this study, development media theory provides a framework for interpreting DWET's agricultural broadcasting as a public-interest service that supports rural development. Together, participatory communication and diffusion of innovations theories guide the analysis of how program interactivity, feedback mechanisms, farmer participation, and message characteristics—including timeliness, practicality, and local relevance—contribute to agricultural development. The study specifically examines (i) access to the station and its agricultural program, (ii) farmers' information needs and preferred content, (iii) self-reported changes in farming practices associated with program listenership, and (iv) barriers to participation and feedback.

2. MATERIALS AND METHODS

A cross-sectional mixed methods design was employed in this research. Data collection involved household surveys, focus group discussions (FGDs), and key informant interviews. Quantitative data were analyzed using descriptive statistics, and qualitative data using thematic analysis. The study was conducted in the Abreha We-Atsbeha kebelle, Kilte Awlaelo District, Eastern Zone of the Tigray Regional State, northern Ethiopia, approximately 35 km northeast of Mekelle (Figure 1). This area is characterized by a semi-arid climate and a mixed crop-livestock agricultural system. Local agriculturalists address unpredictable precipitation through

water harvesting and small-scale irrigation. The community is recognized for its watershed management and climate-resilient agricultural practices.

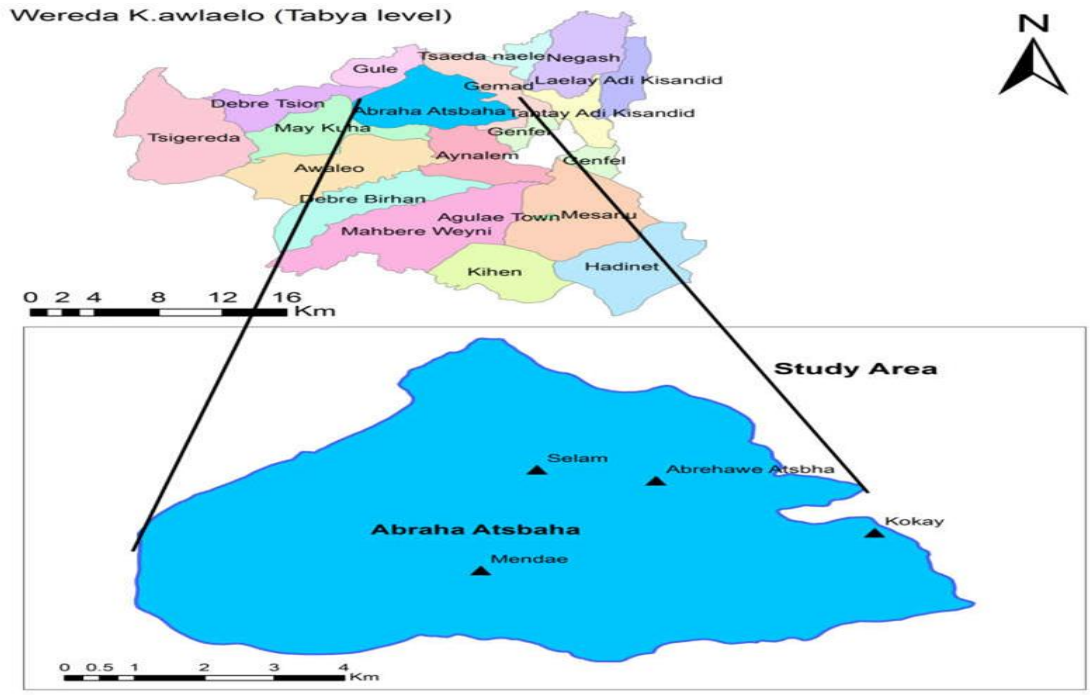


Figure 1. Map of Abreha We-Atsbeha kebelle, Kilte Awlaelo, Tigray, Ethiopia. Mapping Authority, Tigray Regional Bureau (2017).

2.1. Research design, data sources, sampling, and data collection

A mixed-methods approach was used to document household listening behaviors and farmers' experiences with the DWET agricultural radio program Geteratna. Primary data were collected through household surveys, FGDs, and key informant interviews. Secondary data were obtained by reviewing relevant documents and literature. A purposive sampling strategy was implemented to select key informants and FGD participants based on their agricultural expertise and media engagement. The household survey included 121 respondents, selected with the assistance of kebelle leaders to represent diverse household types, including both male- and female-headed families. The survey and qualitative methods explored access to DWET and Geteratna, preferred agricultural information, perceived usefulness of program content, receptiveness to recommendations, and participation through feedback mechanisms such as call-ins and inquiries. Data collection instruments were assessed for clarity and relevance, revised based on local feedback, and administered under field supervision in accordance with established protocols to ensure data quality.

2.2. Analytical Assessment

Survey responses were organized and analyzed using descriptive statistics, including frequencies and percentages, with results presented in tables and figures. Notes from focus

group discussions and interviews were transcribed, coded, and thematically categorized according to the study objectives, such as information requirements, relevance, application, participation, and feedback. The integration of quantitative and qualitative results facilitated the identification of both convergent and divergent trends.

3. RESULTS AND DISCUSSIONS

3.1. Awareness and listening to DWET Radio

DWET radio attains a significantly high audience among farmers in the research region (Table 1). Among the 121 individuals surveyed, 117 (95.9%) acknowledged listening to DWET radio. Only 4 (3.3%) reported not doing so. Knowledge and listenership of the agricultural radio program "Geteratna" were also substantial. A total of 113 respondents (92.6%) reported listening to the program, while just 8 (6.6%) did not. These findings demonstrate that DWET radio has successfully reached rural farming communities and serves as a crucial medium for disseminating agricultural information.

The findings are consistent with previous studies that identify radio as one of the most accessible and cost-effective communication channels for rural farming communities, particularly where access to extension services and digital technologies is limited (Chapman et al., 2003; Rao, 2015). The high listenership reported in this study indicates substantial farmer exposure to agricultural information through radio, reinforcing its continued importance as a trusted source of knowledge. Radio's ability to reach large audiences, overcome literacy barriers, and deliver information in local languages makes it an effective extension tool (Chapman et al., 2003). As noted by Rao (2015), radio provides timely information on crop production, pest management, weather conditions, and market opportunities. The strong audience reach of DWET radio therefore suggests considerable potential to influence farmers' knowledge, attitudes, and decision-making. However, the lower proportion of respondents who regularly listened to the "Geteratna" program compared with overall DWET listenership indicates that access alone does not guarantee engagement. Factors such as inconvenient broadcast schedules, competing responsibilities, and perceived program relevance may affect participation, consistent with evidence that farmers' sustained involvement depends on the timeliness, relevance, and usefulness of broadcast content (Rao, 2015).

Although nearly all respondents reported listening to DWET radio, simple exposure measures may not adequately explain differences in agricultural knowledge or adoption of recommended practices. Variations in outcomes are more likely associated with listening frequency, attention to broadcasts, trust in the information source, and the extent to which advice is implemented.

Similar findings from Ghana show that high radio listenership does not automatically translate into effective information use; impact depends on both exposure and application of the information received (Antwi, 2022). Focus group discussions supported the survey results, with participants reporting familiarity with DWET radio and incorporating its programs into their daily routines, thereby strengthening the credibility of the findings. Within the broader Ethiopian agricultural extension context, DWET radio appears to complement conventional extension services by expanding farmers' access to agricultural information (Ministry of Agriculture and Natural Resources, MoANR, 2017). While the high awareness and listenership levels demonstrate effective dissemination, they do not by themselves confirm developmental impact. The effectiveness of the "Geteratna" program should therefore be assessed through its contribution to farmers' knowledge, information-seeking behavior, adoption of recommended practices, and productivity improvements (MoANR, 2017; Rao, 2015).

Table 1. Awareness and listening to DWET Radio

S.No	Item	Variables	Response	
1.	Awareness and listening to DWET radio		Frequency	Percent
		Yes	117	95.9
		No	4	3.3
		Total	121	100
2.	Awareness and listening to "*geteratna*" radio program	Yes	113	92.6
		No	8	6.6
		Total	121	100

3.2. Respondents' participation in the program

The "Geteratna" program reached a considerable audience, active participation was relatively low (Figure 2). Of the 121 respondents, only 43 (35.2%) reported participating in the program, whereas 76 (62.3%) did not. This highlights a clear gap between access to agricultural information and active engagement. Previous studies suggest that radio is most effective when it facilitates two-way communication, allowing farmers to ask questions, share experiences, and receive tailored advice rather than simply receiving information (Chapman et al., 2003; Rao, 2015). The findings therefore indicate that most farmers use "Geteratna" primarily as an information source rather than as an interactive platform.

Focus group discussions revealed that low participation was largely driven by practical and institutional barriers rather than a lack of interest. Participants noted challenges such as the absence of a dedicated contact line, difficulties reaching the station by phone, and limited airtime for listener interaction. Similar barriers have been identified in previous studies, which found that technological and organizational constraints often limit farmers' ability to

engage with media-based extension services (Manyozo, 2012; Rao, 2015). These findings suggest that participation depends not only on farmers' willingness to engage but also on the availability and accessibility of communication channels.

Economic and technical factors further constrained participation. Many respondents reported not owning radios, while others indicated that the cost of phone credit discouraged them from contacting the station. Some participants also noted that contact information was announced too quickly during broadcasts, making it difficult to record details, although a few used SMS to communicate with the program team. Consistent with previous research (Aker, 2011; Manyozo, 2012; Hudson et al., 2017), the results show that access-related challenges are the primary barriers to engagement. Strengthening the program's interactivity through dedicated contact lines, increased airtime for listener feedback, expanded SMS options, and toll-free or IVR services could enhance participation, improve knowledge sharing, and increase the relevance and adoption of agricultural information.

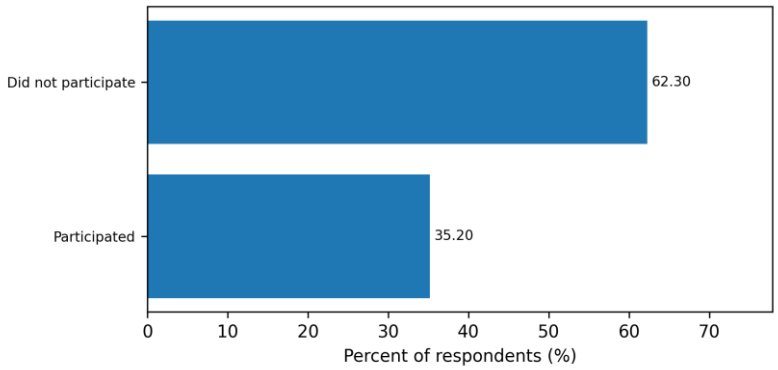


Figure 2. Respondents' participation in the 'Geteratna' program

3.3. Respondents' topics of interest

The respondents preferred a diverse range of content in the DWET agricultural radio program "Geteratna," with the highest preference given to farmer voice segments and successful agricultural experiences (38.52%) (Figure 3). This finding suggests that farmers value practical knowledge shared by their peers, which they often perceive as more credible and relevant because it reflects similar local conditions (Chapman et al., 2003; Davis & Sulaiman, 2014). The strong interest in farmer success stories highlights the importance of social learning, as farmers are more likely to adopt innovations when they observe positive results among fellow farmers (Rogers, 2003; Manyozo, 2012). Increasing the inclusion of local testimonies and success stories could therefore enhance listener engagement and improve the relevance of program content.

Market information was the second most preferred topic (22.95%), followed closely by plantation and meteorological information (21.31%). These results indicate that farmers require information that supports both production and marketing decisions. Access to market prices, sales opportunities, weather forecasts, and seasonal advisories can help farmers improve planning, reduce risks, and increase profitability (Aker, 2011; World Bank, 2012; FAO, 2018). The demand for such information suggests that "Geteratna" plays an important role in supporting market-oriented and climate-smart agricultural practices.

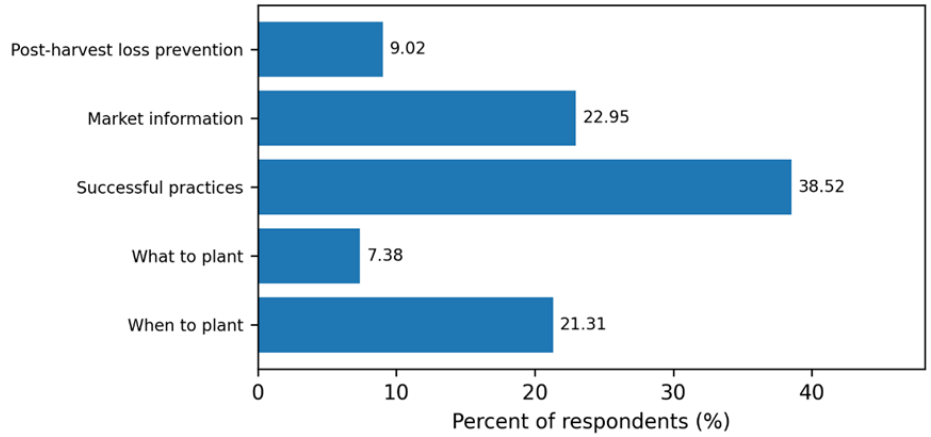


Figure 3. Topics respondents most want to hear in 'Geteratna'

Post-harvest loss mitigation (9.02%) and planting-related information (7.38%) received comparatively lower preferences. However, this does not imply that these topics are unimportant; rather, farmers may already obtain such information from extension agents, input suppliers, or previous broadcasts. Overall, the findings suggest that respondents value content that combines technical knowledge with practical experiences and addresses multiple stages of the agricultural value chain. While these preferences indicate that the program aligns well with farmers' information needs, they do not by themselves demonstrate improvements in productivity or livelihoods. Such impacts require further evidence on changes in knowledge, practice adoption, and agricultural outcomes, which are examined in subsequent sections of the study.

3.4. Lessons respondents learnt from the agricultural topics

Research shows that most farmers listen to DWET and the "Geteratna" program, but few interact. The literature stresses that involvement is important for program success. When model farmers share information through their own experiences, the broadcasts become more relatable and persuasive. This approach helps listeners feel a sense of ownership and understand the content better (Khanal, 2011). However, past studies also warn that if producers do not connect

well with their audience, programming may fail to address local needs, even if it seems broadly relevant (Chapman et al., 2003; Nyareza & Dick, 2012).

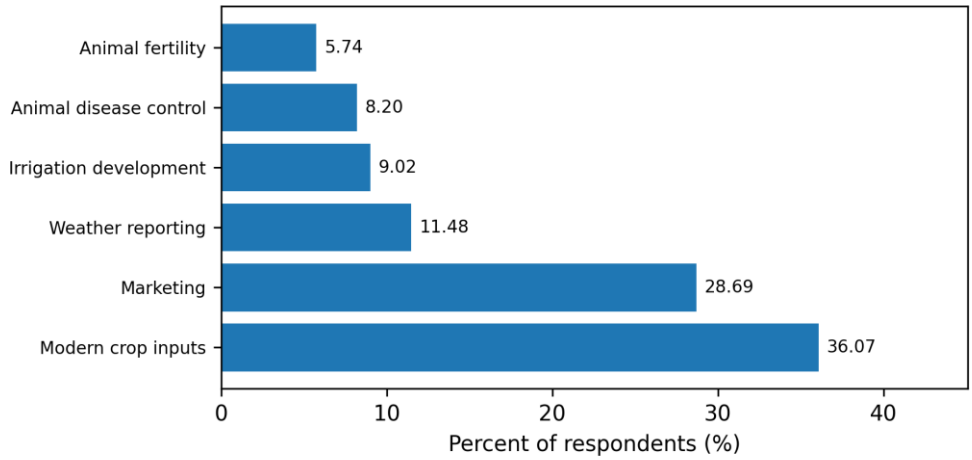


Figure 4. Lessons respondents reported learning from 'Geteratna'.

The study measured learning outcomes by asking respondents if they gained knowledge from the agricultural broadcasts. If so, they specified the main messages they remembered, as shown in Figure 4. Responses indicate that the program primarily provides practical advice on production and commercialization. Most people (36.07%) received information on agricultural inputs such as fertilizers and certified seeds. This suggests that "Geteratna" helps promote modern inputs and improved technologies. Marketing lessons were the next most common (28.69%), showing farmers value both technical and market guidance. This matches earlier research, which identifies market information as a top concern for audiences.

In addition to these main topics, participants learned about weather (11.48%) and irrigation (9.02%). Both topics help manage risk and plan production when rainfall and water are uncertain. Fewer people learned about animal disease prevention (8.20%) and fertility (5.74%). This shows that while some want livestock information, most focus on crop inputs and markets. The program addresses the core challenges faced by smallholder farmers: access to inputs, market participation, and climate and water issues. These results are based on self-reported memories, not on confirmed changes in actions or knowledge. So they should be seen as signs of perceived learning, not proof of better outcomes. Right now, it is fair to say the program offers information farmers find useful. This is an important step toward adoption and productivity gains.

Qualitative studies show why some messaging styles work better than others. Farmers prefer listening to relatable peers because these speakers use simple and easy-to-understand language. Though many appreciate expert interviews, participants said expert input can be too technical,

making it harder to understand. This highlights the need to combine expert advice with farmer stories and local examples. Respondents who valued the "farmers' voice" said that peer success stories directly addressed their own issues and suggested real solutions. Both survey results and qualitative feedback suggest that "Geteratna" can improve learning by mixing technical advice with local storytelling. Limited chances for interaction are important, as less feedback and participation reduce the program's ability to adjust content and ensure recommendations are clear and relevant.

3.5. Farmers' perception of the agricultural program's content

The attitudes of farmers toward the "Geteratna" agricultural radio program were evaluated using metrics of audience involvement, satisfaction with the information presented, and confidence in the quality and utility of the program's material. One variable explored was whether respondents had previously offered comments to DWET radio about the program. Figure 5 illustrates that a predominant 67.21% of respondents claimed they had never offered feedback to the station, whilst just 31.97% acknowledged having done so. The data indicate that while the program has a substantial audience, direct interaction between listeners and producers is somewhat restricted. Comparable trends have been documented in research on rural radio and agricultural communication, in which audience exposure often exceeds audience contact due to logistical, technological, and institutional impediments that hinder participation (Chapman et al., 2003; Rao, 2015).

The prevalence of non-feedback should not be construed as an indication of discontent with the program. Research in agricultural communication reveals that farmers often adopt a passive listening position while valuing and consistently using information acquired through radio broadcasts (Manyozo, 2012). In several rural settings, audiences encounter tangible obstacles to communication, such as limited access to telecommunications services, high communication costs, and limited opportunities to engage with broadcasters (Hudson et al., 2017). Thus, the lack of feedback may indicate structural limitations rather than unfavorable views of the program's quality. This view aligns with previous findings from the current study, which revealed limited engagement despite extensive knowledge of and listenership for the program.

The results indicated that respondents who offered feedback generally did so to get market pricing data and other economically significant updates pertinent to agriculture marketing. This outcome underscores the pivotal role of listener involvement and indicates that farmers are inclined to initiate communication when the anticipated benefits outweigh the costs of contacting the station. Prior research has shown that access to market information on prompt

markets may markedly enhance farmers' decision-making, bolster their negotiating power, and augment income prospects (Aker, 2011; World Bank, 2012). The respondents' inclination to reach out to the station primarily for market-related information, therefore, corroborates previous results indicating that market information is one of the most esteemed content sections within the “Geteratna” program.

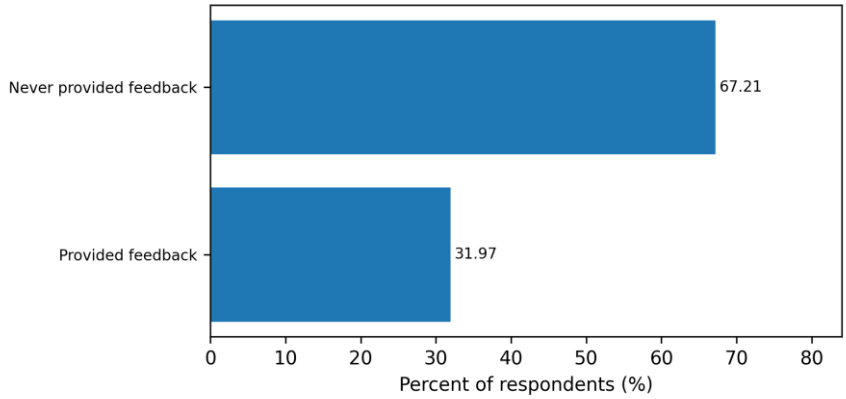


Figure 5. Whether respondents provided feedback to DWET about ‘Geteratna’

The low level of input has substantial consequences for the program's efficacy. Participatory communication theory argues that communication is most successful when information is shared in multiple directions, not just from broadcaster to listener (Manyozo, 2012). Feedback methods enable program creators to test audience understanding, discover new information requirements, and tailor material to local conditions. If feedback opportunities are limited, broadcasters may find it more difficult to assess the relevance and utility of program material, thereby reducing the program's responsiveness to farmers’ changing requirements (Chapman et al., 2003). Thus, while the program appears to be successful in reaching listeners, the limited input observed in this study may limit its potential to fully benefit from participatory agricultural communication.

The results also indicate that the program's interactive value is strongly related to its role as a source of market intelligence. As the main driver for feedback provision was market-related issues, enhancing communication channels might boost the program’s contribution to market-oriented farming. Similar results have also been observed in agricultural information systems research, which indicates that interactive communication platforms enhance information exchange and enable more effective decision-making among farmers (Davis & Sulaiman, 2014). The show may better contribute to the transmission of agricultural knowledge and the enhancement of rural livelihoods if more opportunities were created for listeners to request information and discuss concerns.

The results indicate that while farmers express a positive attitude toward the “Geteratna” program, barriers to feedback and participation restrict opportunities for two-way communication. The evidence suggests that DWET radio should strengthen and formalize its mechanisms for collecting listener input. Potential interventions include establishing a dedicated contact line for the program, allocating additional airtime for listener calls, implementing low-cost SMS services, and adopting interactive voice response (IVR) technologies. These strategies are consistent with recommendations from the participatory extension and rural communication literature, which emphasize that ongoing dialogue between information providers and users enhances content relevance, audience satisfaction, and the likelihood of adoption of agricultural information (Chapman et al., 2003; Rao, 2015; Hudson et al., 2017). Consequently, increasing opportunities for audience response may improve both the perceived quality and practical utility of the “Geteratna” program.

3.6. Farmers' Contentment with DWET's Initiative

The survey also examined farmers' satisfaction with DWET's handling of audience comments, focusing on those who had submitted feedback. Satisfaction was measured with a simple Yes/No question. Figure 6 shows that 72.95% of respondents who gave feedback were satisfied with DWET's response. This suggests that those who interact with the station often find it responsive and sensitive to their concerns. Prior research shows that responsiveness is vital for building trust between information providers and farmers, as it confirms that farmers' concerns are heard and addressed (Chapman et al., 2003; Rao, 2015). Therefore, the high satisfaction reported by respondents may boost trust in the "Geteratna" program as a reliable source of agricultural information.

The results suggest that promptly responding to listener criticism can build trust in broadcast messaging and encourage future participation. Participatory communication theory states that audiences trust and engage more when communication is interactive rather than one-way (Manyozo, 2012). Research on agricultural extension shows that farmers’ trust grows when advisory services resolve inquiries and clarify concerns (Davis & Sulaiman, 2014). High satisfaction across feedback sources shows that DWET is well-positioned to build lasting audience relationships and support informed agricultural decisions.

Nevertheless, the results must be balanced with earlier data showing that a large majority of respondents in Figure 5 (67.21%) had never sent comments to the station. This means that the high satisfaction rate reflects the experiences of a smaller group of engaged listeners, not the entire audience. Although the program seems effective in responding to those who reach out,

this responsiveness may not benefit all listeners equally. Similar studies in rural communication have found that a small group of highly engaged users is often responsible for most media interactions, while institutional barriers limit wider engagement (Hudson et al., 2017; Manyozo, 2012). Therefore, efforts to boost responsiveness should also include programs that broaden engagement opportunities in the larger agricultural community.

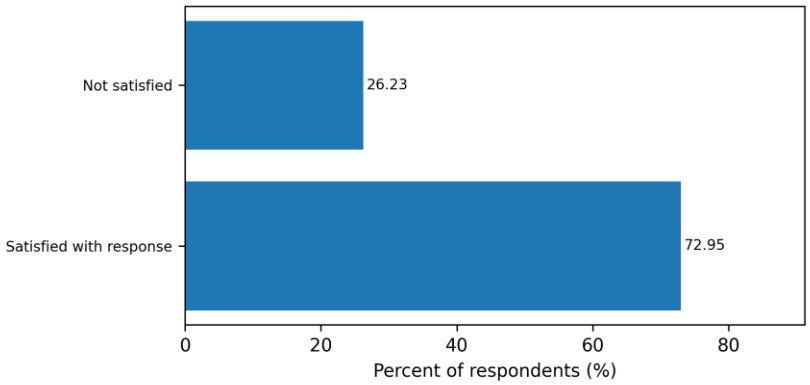


Figure 6. Satisfaction with DWET's response to feedback

The qualitative results from the key-informant interview with the Abreha We-Atsbeha community coordinator offer insight into the "Geteratna" program's strengths and weaknesses. The coordinator noted that the initiative enhances agricultural efficiency and helps transform farmers' livelihoods. These beliefs align with studies showing that agricultural radio can improve extension services by efficiently and economically providing practical information to many farmers (Chapman et al., 2003; Rao, 2015).

However, the informant also described operational hurdles that could weaken the program's impact. These include transmission problems and structural constraints. A significant concern raised was the limited airtime for model farmers to share their experiences. Time restrictions often prevent successful farmers from fully explaining their methods. This is notable because earlier research found that respondents preferred farmer success stories and experience-sharing segments. Studies on adult education and agricultural extension have shown that experiential learning and peer-to-peer exchange are effective for encouraging technology adoption and behavior change (Rogers, 2003; Davis & Sulaiman, 2014). Omitting these segments may result in less useful information for listeners and diminish the program's educational value.

The key informant also suggested including more "middle-income" farmers as guest speakers. These farmers can act as practical role models for various agricultural practices. This advice aligns with the diffusion of innovations theory, which states that people are more likely to adopt innovations when they see success among peers from similar backgrounds (Rogers, 2003).

Increasing the diversity of guest farmers could strengthen audience connection and make the content more relevant and useful.

The findings indicate that DWET is mostly effective in meeting the expectations of listeners who give feedback and is viewed as a reliable source of agricultural information. Still, the qualitative results reveal a need to improve farmer-experience segments to boost their instructional value. Greater audience interaction, more airtime for farmer discussions, better transmission, and a wider range of guest farmers could enhance the program's inclusivity and impact. These changes align with participatory communication theory, which values active dialogue, collaborative learning, and engagement as key parts of successful rural communication (Manyozo, 2012; Rao, 2015). Thus, while there is satisfaction among active listeners, further refinements in participatory design and structure could strengthen the program's influence on agricultural education across the broader farming community.

3.7. Degree of Respondents' Adoption of Agricultural Information.

The adoption of agricultural knowledge from the DWET "Geteratna" program can be understood through a communication-for-development perspective. Development media theory suggests that mass media can support agricultural development by increasing access to information, particularly for farmers with limited access to formal education and extension services (McQuail, 1987; Jemal, 2013). However, diffusion theory emphasizes that awareness alone does not guarantee adoption, as farmers must also have the resources, support, and favorable conditions needed to apply new practices (Rogers, 1973; Rogers & Shoemaker, 1971). Consistent with this view, focus group discussions and interviews identified several barriers to implementation, including reliance on traditional practices, the use of overly technical language, and limited access to essential agricultural inputs such as certified seeds and fertilizers.

Qualitative findings further revealed that farmers' responses to radio messages are influenced by their trust in local support systems. When input distribution and extension services are perceived as unreliable or inequitable, farmers may be less willing to adopt recommendations, regardless of their perceived value. These findings support previous research indicating that agricultural radio is most effective when combined with accessible extension services, reliable input supply systems, and opportunities for farmer interaction and peer learning (Chapman et al., 2003; Nyareza & Dick, 2012). Thus, the effectiveness of "Geteratna" depends not only on the quality of information provided but also on the broader institutional environment that enables farmers to act on that information.

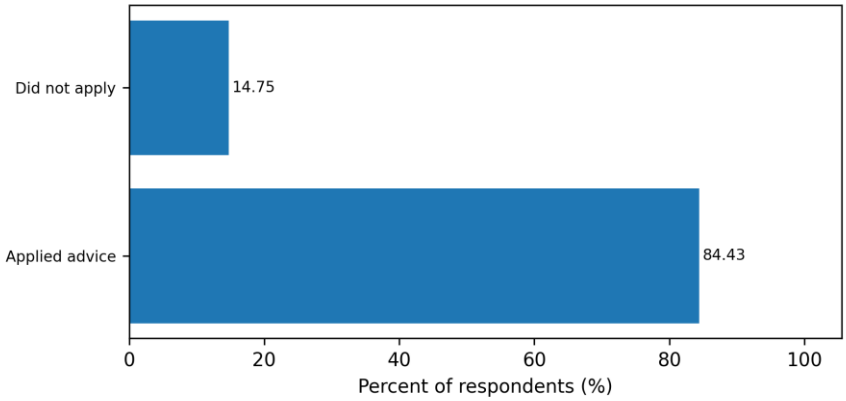


Figure 7. Reported application of information obtained from 'Geteratna'

Despite these constraints, the survey findings indicate substantial self-reported utilization of program information. Figure 7 demonstrates that a large majority of respondents (84.43%) reported applying at least some information obtained from "Geteratna" on their farms. This high rate of reported application suggests that the program's messages are not only received but also regarded as actionable by many listeners, which is notable given previously identified limitations in participation and feedback. The measure of adoption used here is broad ("applied at least some information") and may include a range of behavioral changes, from minor adjustments in timing or management to more resource-intensive modifications requiring purchased inputs.

While the findings indicate substantial uptake of information from the DWET "Geteratna" program, they should be interpreted as evidence of broad applicability rather than definitive proof of sustained adoption. A more comprehensive assessment would require examining the specific practices adopted, the intensity and duration of their use, and their measurable effects on productivity and income. When considered alongside qualitative evidence of input shortages and service limitations, the results suggest that the extent of adoption is influenced by factors such as access to resources, the clarity and relevance of program content, and the availability of reliable local support systems that enable farmers to implement and sustain recommended practices.

The findings nevertheless show that listeners perceive "Geteratna" as an important source of agricultural knowledge and innovation. Table 2 indicates that 86.1% of respondents believed the program promotes modern agricultural practices, while 94.3% reported that it contributes to improved agricultural production. These results suggest that the program plays a significant educational role by providing farmers with timely and relevant information on improved farming methods, input use, pest management, and market opportunities. Consistent with

previous studies (Chapman et al., 2003; Rogers, 2003; Davis & Sulaiman, 2014; Hudson et al., 2017), the findings highlight the potential of agricultural radio programs to enhance knowledge acquisition and support the diffusion of agricultural innovations among rural farming communities.

3.8. Respondents' utilization of the radio program information

These findings reflect farmers' perceptions rather than objective measures of productivity and therefore should not be interpreted as evidence of a causal impact on agricultural production. Nevertheless, respondents expressed strong confidence in the program's effectiveness, with 86.1% reporting that they had applied at least some of the lessons from "Geteratna," while 13.1% had not. This high level of self-reported adoption suggests that the program provides information that farmers perceive as relevant, practical, and applicable to their farming activities. Consistent with the diffusion of innovations theory (Rogers, 2003), the program's focus on practical agricultural issues, local examples, and farmers' experiences may have enhanced the credibility and relevance of its messages, thereby encouraging adoption. However, implementation was not assessed in terms of its extent, frequency, or duration, and farmers likely varied in the types of practices adopted, ranging from simple adjustments in planting schedules to more resource-intensive investments in improved seeds, fertilizers, irrigation, or pest management. As agricultural extension research indicates, adoption is often shaped by access to resources, financial capacity, and institutional support (Davis & Sulaiman, 2014). Therefore, while the findings provide strong evidence of behavioral adoption, they do not reveal the depth or sustainability of implementation across different agricultural practices.

Respondents assessed their current productivity relative to the period before the "Geteratna" program. They reported substantial perceived improvements, with the share identifying as "productive" or "very productive" rising from 56.5% before the program to 90.2% at the time of the survey. In comparison, those reporting "not productive" declined from 42.6% to 9.0% (Table 2). These findings suggest that farmers perceive notable gains in agricultural performance and attribute part of these changes to information from the program, consistent with evidence that agricultural communication and extension services can improve decision-making and outcomes (Aker, 2011; Hudson et al., 2017). However, both current and retrospective productivity measures are based on self-reports and are therefore subject to recall and attribution biases, meaning the observed differences cannot be interpreted as causal effects of the program alone (Rogers, 2003). While high perceived usefulness (94.3%) and strong message adoption (86.1%) indicate that "Geteratna" is a valued source of agricultural

knowledge, its impact is likely strengthened when combined with complementary support such as extension services, input access, training, and feedback mechanisms that help translate information into sustained productivity gains (Davis & Sulaiman, 2014; Rao, 2015).

Table 2. Respondents' utilization of the radio program information

S.No Item	Variables	Response	
Does the Geteratna Radio program helpin introducing modern agricultural practices to farmers?		Frequency	Percent (%)
	Yes	105	86.1
	No	15	12.3
	Total	120	100
Does Geteratna radio program helpfarmer improve farm productivity?	Yes	115	94.3
	No	6	4.9
	Total	121	100
Implementation of geteratna radio program messages by farmers	Yes	105	86.1
	No	16	13.1
	Total	121	100
Current productivity of farmers	Very productive	21	17.2
	Productive	89	73.0
	Not productive	11	9.0
	Total	121	100
Farm productivity of farmers before Introduction of "geteratna" radio program	Very productive	7	5.7
	Productive	62	50.8
	Not productive	52	42.6
	Total	121	100

3.9.Benefits of applying farm information

Respondents were asked about the perceived benefits of agricultural knowledge disseminated through the DWET "Geteratna" initiative, focusing on outcomes rather than exposure or implementation. Most respondents reported at least one positive effect, with the most common being the adoption of improved or modern farming techniques (27.05%), followed by advancements in apiculture (22.95%), improved fertilizer use (19.67%), and increased household food security (17.21%), while 12.3% reported no perceived benefit, indicating uneven program effects likely influenced by differences in resources, relevance, and implementation capacity (Figure 8). Overall, the distribution of responses suggests that listeners link program content to specific agricultural practices and broader livelihood outcomes, including productivity and food security. However, these perceptions should be interpreted cautiously, as outcomes such as food security are shaped by multiple external factors, including weather conditions, market dynamics, labor availability, and inputs (FAO, 2018; Rogers, 2003), meaning the findings reflect subjective attribution rather than objective measurement of impact.

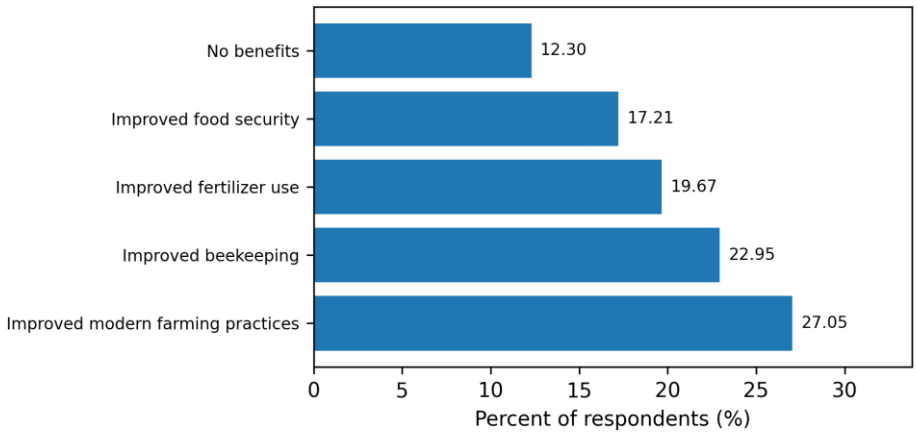


Figure 8. Self-reported benefits from applying 'Geteratna' advice

The reported advantages align with previous research highlighting farmers' preference for practical, experience-based agricultural knowledge, particularly in areas such as fertilizer use, modern farming methods, and diversified livelihoods like beekeeping. However, these findings reflect perceived rather than verified causal effects, as respondents may attribute improvements to the program despite the influence of other factors such as extension services, market conditions, and broader development interventions (Aker, 2011; Davis & Sulaiman, 2014). Qualitative evidence from focus group discussions and interviews further supports the quantitative results, identifying "Geteratna" as a key source of agricultural information in the community, which strengthens confidence in its perceived usefulness (Chapman et al., 2003). Nevertheless, drawing firm conclusions about productivity or welfare impacts requires additional empirical measurement, including adoption intensity, yield or income data, and methods that control for confounding influences (Rogers, 2003; Davis & Sulaiman, 2014).

3.10. Respondents' intent to continue applying agricultural innovations learned from "Geteratna radio program

The DWET "Geteratna" program's ongoing impact was assessed by asking if respondents intended to keep using agricultural knowledge from the radio. Most respondents (84.43%) intended to continue, while 14.75% would not. Although this trend suggests influence beyond short-term use, it is based on self-reported intention and does not establish causality. Research shows that farmers are more likely to maintain innovations perceived as beneficial and suited to their needs (Issahaku & Abdulai, 2020; Davis et al., 2021). The large share of respondents intending to persist indicates that "Geteratna" provides relevant, practical information for ongoing agricultural improvements.

Although only a small proportion of respondents reported unwillingness to continue, this still indicates that the program's messages do not lead to sustained adoption for all farmers. Discontinuance may stem from unmet expectations, limited relevance, or structural constraints such as lack of resources, labor shortages, financial barriers, climate variability, and weak institutional support, which are known to

affect long-term adoption (Ruzzante et al., 2021; FAO, 2022). By contrast, willingness to continue is likely linked to perceived benefits such as improved farming practices, better fertilizer use, expanded beekeeping activities, and enhanced food security, which strengthen trust in innovations and encourage sustained use (Davis et al., 2021). However, because this measure is based on self-reported intention, it reflects perceived value rather than actual long-term behavior, as intentions may not translate into sustained practice under changing conditions. Robust assessment of persistence requires longitudinal evidence, such as follow-up surveys or panel data, to determine which practices are maintained and under what circumstances (FAO, 2022; Ragasa et al., 2023).

3.11. Findings from the focus group discussions

Prior research shows that agricultural radio programs can significantly improve farmers' knowledge and decision-making, especially where extension services are limited, by supporting choices on inputs, planting schedules, pest management, and improved techniques (Kembero, 2014). Focus group discussions in Abreha We-Atsbeha reinforce this, indicating that radio listening is embedded in daily routines and that programs delivered in familiar language and local examples are viewed as more understandable and trustworthy, which helps explain high listenership and preference for farmer-voice segments. As one participant noted, the program provides practical guidance on technologies, seasonal planning, and market information that farmers can apply directly from home.

Participants further emphasized that "Geteratna" influences agricultural decisions through peer learning and social validation, where experiences shared by model farmers make recommended practices appear feasible under local conditions. Content on input use, pest control, and seasonal timing is seen as reducing risk and improving efficiency, while market information supports more commercialized decision-making. This suggests that the program shapes farming as a set of interconnected production and marketing choices rather than isolated technology adoption, with benefits extending to household welfare even when yield gains are not immediately visible.

The discussions also reveal a broader diffusion and motivational effect, where radio messages extend beyond listeners to shape community norms and encourage non-listeners to reconsider traditional practices. Model farmer stories foster social comparison and peer motivation, while the program is also perceived as validating local success and strengthening collective confidence in agricultural improvement. However, participants also suggest that effectiveness depends on maintaining local relevance and clear, non-technical communication, indicating that the program's impact is strongest when messages are practical, relatable, and aligned with farmers' resource realities.

4. CONCLUSIONS

The research indicates that DWET's agricultural initiative, Geteratna, plays a significant role in disseminating agricultural knowledge among farmers in Abreha We-Atsbeha. Most respondents reported regular engagement with the program and considered its content relevant

and useful for agricultural decision-making. The most appreciated segments included success stories, market information, and practical farming guidance.

Overall, the findings suggest that the program supports the dissemination of agricultural knowledge and encourages the adoption of improved farming practices. However, its effectiveness as an interactive communication platform is limited by weak audience participation and insufficient feedback mechanisms. Constraints such as limited access to communication channels and financial limitations further restrict audience engagement.

Geteratna also contributes to strengthening agricultural extension efforts by improving farmers' access to timely and relevant information. To enhance its effectiveness, DWET should improve interactive communication through dedicated phone lines, SMS services, and regular call-in programs. Systematic collection and integration of audience feedback should be prioritized to ensure the content remains responsive to farmers' needs.

In addition, the program should further emphasize farmer success stories, practical demonstrations, and concise technical explanations to improve comprehension and application of agricultural knowledge.

Future research should expand to broader geographic areas, incorporate content analysis of radio broadcasts, and apply objective measures of agricultural outcomes to better assess the long-term impact of agricultural radio programming.

Funding
No funding received for this research.

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