A Comparison of The Effectiveness of Conservational Agricultural Awareness Campaign Programmes Between Oblate Liseli Radio and Mphangwe FM Radio: The Case of The Sentinel Project In Kaoma And Katete Districts In Zambia

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DOI: 10.29322/IJSRP.14.11.2024.p15515

Paper Received Date: 15th November 2024
Paper Acceptance Date: 13th December 2024
Paper Publication Date: 22nd December 2024

Abstract

The research investigated the effectiveness of conservation agricultural awareness campaign programs aired by two community radio stations, Oblate Liseli Radio and Mphangwe FM Radio, in promoting conservation agricultural practices in the Kaoma and Katete Districts of Zambia, respectively. The study assessed the impact of the Sentinel Project, a conservation agricultural program that utilizes radio programs to disseminate information to farmers.

The research adopted a Non-Intervention Research Design with a Mixed-Methods approach, combining both quantitative and qualitative data. Participants included 2 key informants from the said radio stations and 325 farmers from the Kaoma and Katete Districts, selected using random and purposive sampling techniques. Data collection involved in-depth interviews with key informants, semi-structured interviews with farmers, and focus group discussions (FGDs) with farmers. The data collected was analyzed using thematic analysis with Atlas software for qualitative data and SPSS for quantitative data.

The study's findings underscore the effectiveness of community radio stations in promoting conservation agricultural (CA) practices. The Sentinel Project, through its radio programs, successfully raised awareness and positively influenced CA adoption. Both radio stations employed various strategies to promote CA practices, with Mphangwe FM in Katete District achieving a higher overall CA awareness rate compared to Oblate Liseli Radio in Kaoma District. Despite the lower awareness rate in Kaoma, Oblate Liseli Radio demonstrated stronger community engagement efforts. However, lower adoption rates in Kaoma have been attributed to factors such as a larger farmer population and the perception among some farmers that CA practices were too complex, leading them to favour traditional farming methods.

The study recommended the development of tailored content specific to the target audiences to enhance the effectiveness of CA awareness campaigns. This approach recognizes the diverse needs and contexts of farmers, making them feel understood and valued. Sustained support for radio programs that promote CA should also be provided. Additionally, encouraging collaboration with stakeholders is essential for ensuring the long-term adoption of CA practices.

Keywords: Awareness**,** Conservation, Sentinel Project, Mphangwe FM Radio, Oblate Liseli Radio

Introduction

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Agriculture, the cornerstone of development and food security, faces a critical challenge: climate change and environmental degradation. Conservation Agriculture (CA) has emerged as a vital sustainable solution in response to this threat. Educational programs promoting CA practices are crucial, particularly in areas with limited access to diverse media sources (Purushothaman et al., 2010).

In least-developed countries (LDCs), agriculture employs a significant portion of the workforce and contributes substantially to GDP, acting as a major driver of economic development and poverty reduction (FAO, 2015). However, across Africa, the expansion of agricultural land to meet domestic food needs has led to environmental degradation (FAO, 2012). Sustainable intensification approaches like CA offer a solution by increasing yields while minimizing environmental impact and ensuring food security for growing populations (Young & McComas, 2016).

Radio, with its broad reach and accessibility, plays a vital role in disseminating educational programs. However, the adoption of sustainable land management practices like CA remains limited in sub-Saharan Africa, covering barely 3% of cropland (Hamazakaza et al., 2022). In Zambia, factors like lack of complete understanding of CA trade-offs among farmers and inconsistent information delivery at the farm level have hindered adoption rates (Hamazakaza et al., 2022).

Media plays a pivotal role in bridging the information gap and improving CA adoption rates. However, in Zambia, agriculture often takes a backseat to topics like politics, crime, and health in terms of media coverage (Farooq, 2007). This lack of prominence creates an information gap that hinders the dissemination of crucial agricultural knowledge.

The Sentinel Project, an agricultural research initiative dedicated to ensuring food production alongside environmental protection, operates in Zambia, Ghana, and Ethiopia. It aims to generate knowledge for enhancing sustainable development by balancing food production with environmental conservation efforts (Sentinel, 2020).

In Zambia, the Sentinel Project focuses on the Kaoma and Katete districts, where subsistence farming is prevalent. Two community radio stations, Oblate Liseli Radio in Kaoma and Mphangwe FM Radio in Katete, serve as dominant sources of information for these rural communities.

This study aims to conduct a comparative assessment of the effectiveness of these two radio stations in raising awareness about conservation agriculture among farmers. Evaluating the impact of radio in promoting CA is crucial. Ineffective awareness campaigns can negatively impact the adoption rate of these sustainable practices, which are vital for addressing the trade-offs between food security and environmental conservation in Zambia.

Objectives

The general objective of this research is to do a comparative study between Oblate Liseli Radio and Mphangwe FM Radio and find out which one of the two is more effective in the conservation farming awareness creation among farmers in Kaoma and Katete Districts.

(i) To establish whether the two radio stations effectively sensitize the public about conservation farming.
(ii) To determine which radio station is more effective in ensuring farmers adopt CA methods.
(iii) To identify the challenges faced by these radio stations in sensitizing farmers about CA.

Theoretical Framework

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The following theories guide the study:

Development Media Theory: Developed by Denis McQuail in 1987, this theory emphasizes the media's role in aligning its freedom with national development goals. It suggests that media should prioritize content that supports the government's economic agenda and disseminates information crucial for a nation's progress. In this study's context, the theory highlights the importance of media coverage in promoting CA, a practice vital for individual farmers, society at large, and Zambia's national development (Okunna, 1994; Domatob & Hall, 2008; Plaut, 2014).

Theory of Reasoned Action (TRA): Formulated by social psychologists Icek Ajzen and Martin Fishbein in 1975, the TRA posits that a person's behavioural intention is primarily influenced by two factors: their attitude towards the behaviour and the perceived social norms surrounding it. By analyzing how radio campaigns impact farmers' attitudes and perceptions of social norms regarding CA adoption, the study can determine which station is more effective in promoting the practice. This information can be used to identify engaging elements of campaigns and tailor awareness programs to local expectations and values, ultimately leading to greater effectiveness (LaCaille, 2013; Trafimow, 2009).

Theory of Planned Behaviour (TPB): An extension of the TRA, the TPB was also developed by Ajzen in 1980. It builds upon the TRA by incorporating a third-factor influencing behaviour: perceived behavioural control. This theory suggests that a person's intention to perform a behaviour is shaped by their attitude towards it, perceived social norms, and their belief in their ability to perform the behaviour. In the context of this study, the TPB provides insights into how radio campaigns influence these factors and impact farmers' intention to adopt CA practices. By considering all three elements, this comprehensive approach helps create persuasive messages that not only encourage CA adoption but also empower farmers to implement these techniques effectively (Gellman, 2020; Vaughan-Johnston & Jacobson, 2020).

Empirical Literature Review

Sustainable agriculture, especially Conservation Agriculture (CA), is critical to mitigating climate change and improving agricultural productivity. This review examines empirical studies related to CA and the effectiveness of radio campaigns in promoting sustainable agricultural practices in Zambia. It integrates findings from various regions to understand the impact of community radio on farmers' knowledge, attitudes, and adoption of CA techniques.

The impact of Radio on Agricultural Knowledge and Practices: Radio remains a pivotal medium for disseminating agricultural knowledge, particularly in rural areas where other forms of media are less accessible. Studies such as Nabusoba (2014) highlight radio's role in reaching farmers over 40 years old, showing its continued relevance despite the rise of new ICTs. The study found that 58% of farmers preferred radio for agricultural information, significantly higher than TV (18%) and newspapers (22%).

In Kenya, the "Mali Shambani" program on KBC Radio Taifa demonstrated radio's potential in agricultural extension, emphasizing the need for interactive and farmer-centered content to enhance engagement and knowledge transfer (Nabusoba, 2014). Similarly, Mtega's study in Tanzania showed that 61.5% of farmers used radio as their primary agricultural knowledge source, underscoring the medium's reach and accessibility (Mtega, 2013).

Participatory Radio Campaigns: Participatory approaches in radio campaigns have proven effective in motivating farmers to adopt improved agricultural practices. A study by Farm Radio International across five African countries, including Uganda and Malawi, found that involving farmers in campaign production led to higher adoption rates of featured practices. Active participation resulted in a 39% adoption rate, compared to 21% in non-participatory settings (Marube, 2017).

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Conservation Agricultural Promotion in Zambia: Studies like Kalinso (2023), which compared Oblate Liseli Radio and Mphangwe FM Radio, demonstrate the effectiveness of CA awareness programs via radio in Zambia. Both stations significantly impacted farmers' awareness and adoption of CA practices in the Kaoma and Katete districts. The Sentinel Project, which utilizes these radio programs, demonstrated a positive correlation between radio sensitization and CA adoption (Kalinso, 2023).

Barriers to Adoption: Despite the positive impacts, several barriers hinder the widespread adoption of CA such as financial constraints, lack of access to CA tools and seeds, and labour-intensive practices which are significant obstacles. The absence of adequate training and limited access to community outreach programs further exacerbate these challenges. For instance, farmers in both Kaoma and Katete reported difficulties in purchasing rippers and transporting manure, highlighting the need for more comprehensive support systems (Kalinso, 2023).

Community Radio Challenges: Community radio stations face numerous challenges that impact their ability to promote CA effectively. Some of the challenges include funding limitations, logistical constraints, and insufficiently trained personnel often hinder the sustainability and reach of these programs. The CIMA (2007) report outlines these challenges, emphasizing the need for improved financial management, leadership, and resource allocation to enhance the effectiveness of community radio in agricultural education (CIMA, 2007).

Recommendations for Enhancing Effectiveness: To enhance the effectiveness of CA awareness campaigns via radio, several strategies are recommended. These include providing sustained support for radio programs, tailoring content to specific audience needs, and fostering collaborations with stakeholders to ensure the long-term adoption of CA practices. Additionally, improving infrastructure, such as road construction to facilitate access to remote communities, and increasing funding for community radio stations are crucial steps towards achieving broader adoption of CA (Kalinso, 2023).

The current study aims to fill the gap in the literature by conducting a comparative analysis of the effectiveness of Oblate Liseli Radio and Mphangwe FM Radio in promoting conservation agriculture awareness and adoption among farmers in the Kaoma and Katete districts of Zambia. While previous studies have highlighted the role of radio in agricultural extension, few have explicitly focused on comparing the impact of different community radio stations on CA adoption. By assessing the unique approaches, challenges, and successes of these two stations, the study provides valuable insights to enhance the effectiveness of radio campaigns in promoting sustainable agriculture practices in Zambia.

Research methodology

Research design

The study employs a non-interventional research design, specifically naturalistic observation, to examine the natural relationships between factors and outcomes. This approach involves observing people's behaviour in their natural environment, which in this case is the districts where the radio stations operate (Ahmed, S.M. et al., 2004).

Select variables

Model (Adoption of Conservation Agriculture)

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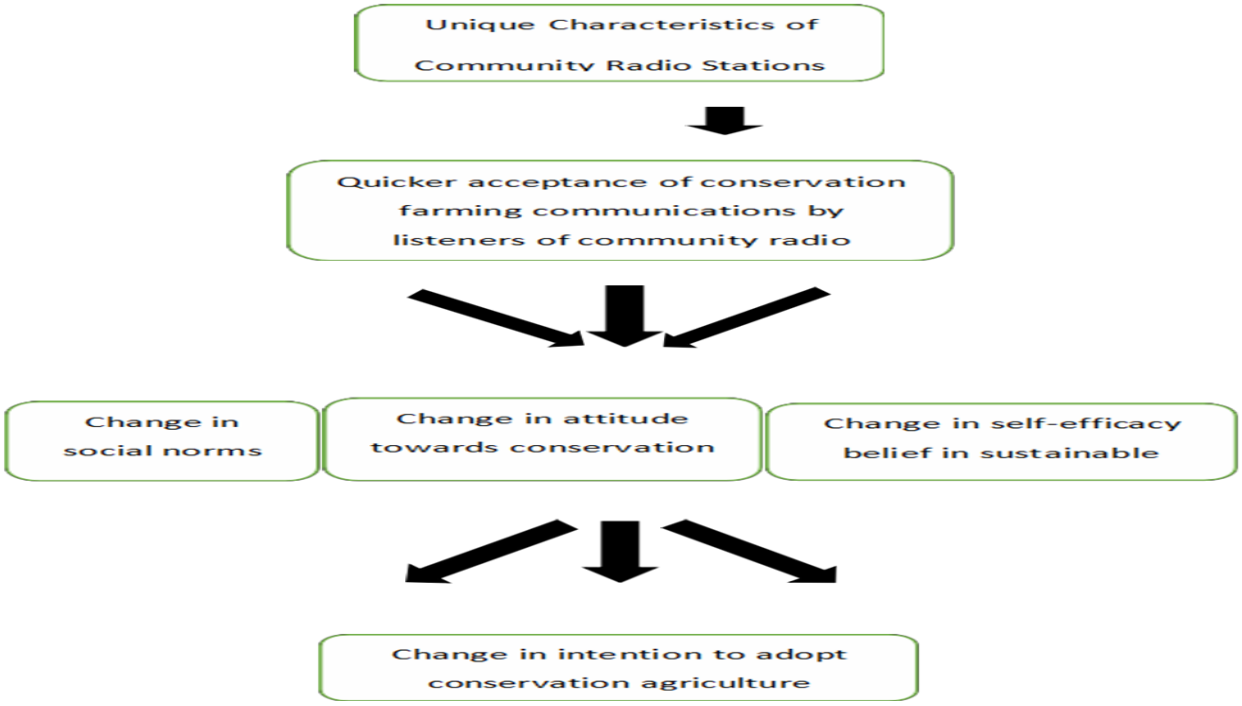

Figure 1: Field data (2023)

Independent Variables (Radio Station Characteristics): Program Content and Reach: types of CA information, frequency of CA-related programming, and accessibility of programs within target communities.

Dependent Variables (Farmer Outcomes): Impact on Farmers' Knowledge and Attitudes: how radio programs influence farmers' understanding and perception of CA practices; Change in Social Norms: how radio programs influence the community's attitude towards CA; Self-Efficacy Belief in Sustainable Agriculture: how radio programs promote farmers' confidence in implementing CA practices; Intention to Adopt Conservation Agriculture: whether radio programs influence farmers' willingness to experiment with and adopt CA practices.

Population and sample

The study targeted farmers and employees of two community radio stations in Zambia, namely: Oblate Radio Liseli in Kaoma District and Mphangwe FM Radio in Katete District. According to the IAPRI Agriculture Indaba Status Report of 2020, the total number of farmers in Kaoma District was 25,000, while in Katete District was 60,000 (Mulenga et al., 2020).

The sample size was calculated using the formula $n = \frac{N}{1+N(e)2}$ where N = target population, n = total sample size, and e = desired margin of error. For Kaoma District, with a total population of 25,000 farmers and a margin of error of 0.10, the target sample size was 100 participants. For Katete District, with a total population of 60,000 farmers and the same margin of error of 0.10, the target sample size was 100 participants.

In total, 200 participants were selected and interviewed: 100 small-scale farmers from the Kaoma District and 100 small-scale farmers from the Katete District. In addition, 2 key informants, one from each radio station, were purposively sampled. The sampling methods employed were purposive and random sampling techniques. Purposive sampling was used to select key informants from the radio stations, while farmers were randomly selected for focus group discussions. A total of 27 focus group discussions were conducted, with each group comprising not more than 12 participants. These discussions included small-scale conservation agricultural farmers and emergent farmers planning to adopt conservation agricultural practices.

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Data collection and analysis

The study used a mixed-methods approach, combining primary and secondary data collection techniques. Primary data was collected through interviews and focus groups, while secondary data was collected from published sources. Data analysis involved both quantitative and qualitative methods, with a focus on trustworthiness and ethical considerations.

Results and Discussion

Gender Characteristics of FGD Participants in Katete and Kaoma Districts

Katete

Gender	Frequency	Percentage
Male	64	64
Female	36	36
Total	**100**	**100**

Kaoma

Gender	Frequency	Percentage
Male	62	62
Female	38	38
Total	**100**	**100**

Table 1: Field Data

Table 1 provides an overview of the gender distribution among FGD participants in the two districts. In Katete District, out of 100 FGD participants, 64% were male and 36% were female. In Kaoma District, out of 100 FGD participants, 62% were male, and 38% were female.

Age Distribution of FGD Participants in Katete and Kaoma District

Katete

Age Group	Frequency	Percentage
15-20	4	4
21-30	17	17
31-40	27	27
41-50	31	31
51-60	15	15
61+	6	6
Total	**100**	**100**

Kaoma

Age Group	Frequency	Percentage
15-20	3	3
21-30	15	15
31-40	23	23
41-50	27	27
51-60	20	20
61+	12	12
Total	**100**	**100**

Table 2: Field Data

Table 2 provides an overview of the age distribution among FGD participants in the two districts. In Katete district, the majority of participants, 31%, were aged 41-50, followed by 27% in the 31-40 age group. The 21-30 age group constituted 17%, 4% were aged 15-20, and 6% were aged 61+, providing diverse perspectives. Similarly, in Kaoma, the majority age group was 41-50, making up 27% of participants, followed by 23% in the 31-40 age group. The 51-60 age group made up 20%, 3% were aged 15-20, and 12% were aged 61+, contributing to comprehensive representation.

Knowledge of awareness of the Sentinel Project in Katete and Kaoma District

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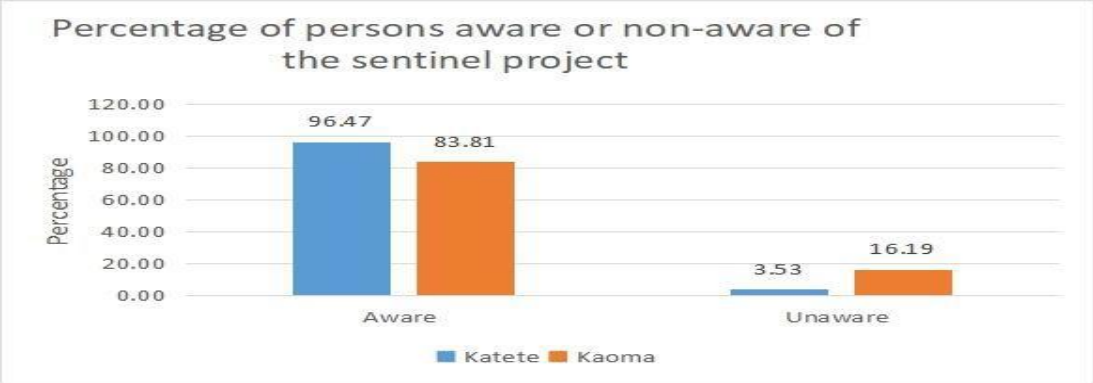

Figure 2: Field Data

Figure 2 shows a significantly higher awareness level regarding the Sentinel Project in Katete compared to Kaoma. In Katete, out of 100 respondents, 96.47% were aware, while only 3.53% were unaware. In comparison, Kaoma District showed a lower awareness rate, with 84% of respondents being aware and 16% unaware.

Knowledge of awareness of the Sentinel Project in Katete and Kaoma District

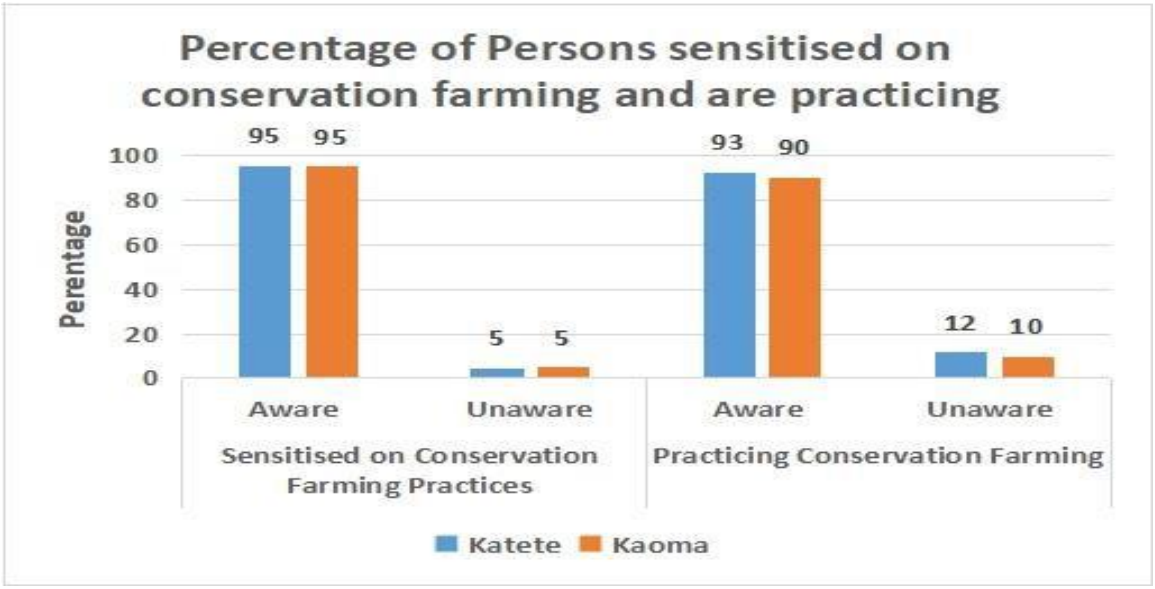

Figure 3: Field Data

Figure 3 above shows that out of 100 respondents from each district, 95% of people in both Katete and Kaoma were sensitised on conservation farming practices. In terms of active practice, 93% of respondents in Katete engage in conservation farming, while 90% do so in Kaoma. Additionally, a small percentage, 12% in Katete and 10% in Kaoma, revealed that they still rely on traditional farming methods, mostly older community members.

Practices of conservation agriculture among the farmers

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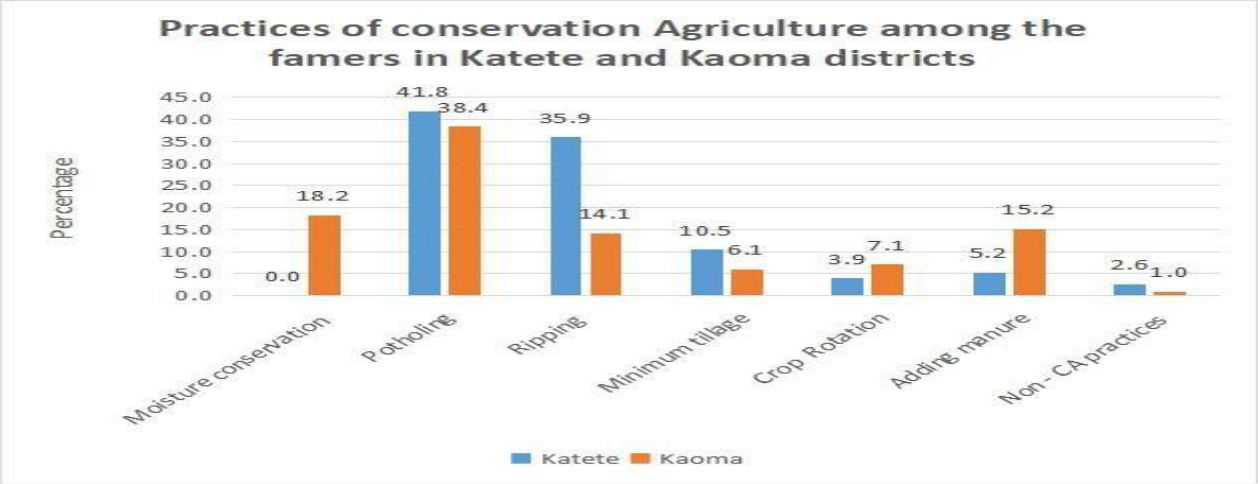

Figure 4: Field Data

Figure 4 compares different agricultural practices related to conservation agriculture (CA) between farmers in the Katete and Kaoma districts. Key findings were Moisture Conservation in Katete; there is no participation in moisture conservation practices. In contrast, Kaoma has an 18.2% participation rate in moisture conservation. Potholing: Katete leads in potholing with a participation rate of 41.8%. Kaoma follows closely with 38.4% participation. Ripping: Katete practices ripping more actively, with a rate of 35.9%. Kaoma has a lower participation rate of 14.1% in ripping. Minimum Tillage: Kaoma takes the lead in minimum tillage practices, with 35.9% participation. Katete has a lower rate of 10.5% in this category. Crop Rotation: Katete participates in crop rotation practices with 7.1%. Kaoma has a lower participation rate of 3.9%. Adding Manure: Katete slightly surpasses Kaoma in adding manure practices, with a rate of 5.2%. Kaoma follows with a participation rate of 5.0%. Non-CA Practices Both districts have minimal participation in non-conservation agricultural practices. Kaoma slightly exceeds Katete in this category.

The effectiveness of the two community radio stations in ensuring that farmers in their respective districts practice conservation farming

Oblate Radio Liseli	**Mphangwe FM Radio**

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Strengths • Broad reach: Covers a large area (81%) in the Western Province. • Participatory approach: Engages farmers directly through community outreach projects. • Multilingual broadcasts: Reaches a wider audience by broadcasting in all local languages **Challenges:** • Resource limitations: These include insufficient fuel, a lack of adequately trained personnel, and limited resources for outreach projects (potentially including radio cassettes). Limited funding This includes limited operational funds, airtime constraints, and dependence on church and community support. • Limited engagement: This encompasses a lack of listener involvement in program design, a top-down approach to community engagement, and limited community engagement with new participants. • Communication barriers: This includes language barriers and lack of localized communication strategies.	Strengths • Broad reach: Only reaches 70% of the Eastern Province. • Strong network of listener clubs (25+): Facilitates information dissemination within communities. • Dedicated agricultural & CA programming: Provides consistent access to CA information **Challenges:** • Network limitations: Poor reception in some areas hinders accessibility. • Resource limitations: This includes the absence of radio cassettes, challenges purchasing fuel and batteries, and limited resources to sustain CA programs. Dependence on donor support can lead to program suspensions due to a lack of funds. • Limited engagement: This encompasses a lack of listener involvement in program design and a top-down approach to communication activities. • Communication barriers: This includes difficulty communicating with farmers due to language and lack of localized communication strategies.

Table 3: Field Data

Table 3 shows that Interviews with key informants from Oblate Liseli Radio (Kaoma) and Mphangwe FM Radio (Katete) shed light on their strengths and challenges in promoting Conservation Agriculture (CA) practices.

Oblate Liseli Radio boasts a broad reach, covering over 81% of the Western Province. They actively engage farmers through community outreach projects, fostering a two-way communication channel. Additionally, their multilingual broadcasts ensure inclusivity and program comprehension for a diverse audience. However, limitations in resources for fuel, outreach materials, and trained personnel hinder their program effectiveness. They also acknowledge the need to move beyond a top-down approach and encourage greater listener involvement in program design. Language barriers and the lack of localized communication strategies are areas identified for improvement.

Mphangwe FM Radio leverages a strong network of listener clubs, facilitating information sharing and peer-to-peer learning within communities. Dedicated agricultural and CA programming provides farmers with consistent access to CA information. However, their reach is limited by network coverage issues in some areas of Katete. Similar to Oblate Liseli Radio, they struggle with resource limitations, including a lack of radio cassettes, fuel, and batteries, along with limited funding to sustain CA programs. Encouraging

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listener participation in program design and moving away from a top-down communication style are ongoing efforts. Language barriers and the lack of localized communication strategies present challenges that they are committed to addressing.

Discussion of the Findings

The study aimed to compare the effectiveness of Radio Oblate Liseli and Mphangwe FM Radio in promoting conservation agricultural awareness among farmers in Kaoma and Katete Districts. The research questions focused on evaluating the radio stations' sensitization efforts, determining which station was more effective in ensuring farmers adopt conservation agricultural (CA) methods and identifying the challenges faced by these stations in sensitizing farmers about CA.

General Awareness and Impact: Both Oblate Liseli Radio and Mphangwe FM Radio have made significant contributions to promoting conservation farming practices in their respective districts. The Sentinel Project facilitated through these radio stations, has positively influenced farmers' awareness and adoption of CA practices. This aligns with the Development Media Theory, which emphasizes the media's role in supporting national development goals. By prioritizing CA content, these stations contribute to individual farmers' well-being and Zambia's overall progress (Okunna, 1994).

Comparative Effectiveness: Mphangwe FM Radio in Katete demonstrates a higher overall awareness rate of CA compared to Oblate Liseli Radio in Kaoma. This difference can be attributed to Mphangwe FM's broader reach and larger farmer population. However, Oblate Liseli Radio compensates with intensive community engagement efforts, including radio listening clubs and community outreach meetings. The Theory of Reasoned Action (TRA) and the Theory of Planned Behaviour (TPB) come into play here. By analyzing farmers' attitudes, social norms, and perceived behavioural control, it can be understood why certain stations are more effective in promoting CA adoption (LaCaille, 2013).

Adoption Rates: The higher adoption of CA practices in Katete compared to Kaoma reflects the influence of demographics. Younger farmers in Katete are more open to adopting CA, while older farmers in Kaoma tend to stick to traditional methods due to perceived labour intensity. The TRA and TPB theories help explain these behavioural intentions. By considering attitudes, social norms, and perceived control, the awareness programs can be tailored to specific farmer groups, enhancing adoption rates (LaCaille, 2013).

Challenges: Both radio stations face common challenges, including financial constraints, resource limitations, and network coverage issues. These barriers impact the sustainability and reach of their CA awareness programs. The CIMA (2007) report highlights the need for improved financial management, leadership, and resource allocation to enhance community radio's effectiveness in agricultural education. Strengthening partnerships and securing funding can address these challenges.

Conclusion

While both radio stations effectively sensitize farmers about CA, Oblate Liseli Radio seems to be more effective in promoting adoption through its wider coverage, participatory approach, and face-to-face community engagement. However, both stations continue to face funding, resource and logistical constraints that limit their outreach. Addressing these challenges through increased stakeholder engagement, funding and innovative approaches can help enhance the role of community radio in driving sustainable agriculture practices.

Recommendations

(i) Enhance community radio programs with tailored content specific to local contexts and audiences.

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(ii) Provide sustained support for radio programs to maintain and increase CA awareness.

(iii) Foster collaboration between radio stations and agricultural stakeholders to ensure the long-term adoption of CA practices.

(iv) By addressing these recommendations, community radio stations can further improve their effectiveness in promoting sustainable agricultural practices among rural farmers in Zambia.

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