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Effectiveness of Mass Media in Dissemination of Climate-Smart Agricultural Practices Among Crop Farmers in Taraba State, Nigeria

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Abstract*— This study assessed the effectiveness of mass media in the dissemination of climate-smart agricultural practices among crop farmers in Taraba State, Nigeria. Specifically, the study examined the climate-smart agricultural information disseminated to crop farmers through mass media, the information accessed and utilised by farmers, and the effectiveness of mass media channels in disseminating climate-smart agricultural practices. A multi-stage sampling technique was used to select 351 crop farmers in the study area. Data were collected using structured questionnaires and analysed using descriptive statistics and rating scales. The findings revealed that climate-smart agricultural information disseminated through mass media covered crop management, soil and water conservation, pest and disease management, climate information and risk management, as well as livelihood diversification. The most commonly disseminated practices included timely planting and harvesting (85.19%), small-scale livestock keeping (87.75%), off-farm income activities (82.34%), recommended fertiliser application (78.35%) and minimum/zero tillage (78.06%). The findings further showed that information on timely planting and harvesting (mean = 3.09), timely weeding (mean = 3.06), intercropping (mean = 3.01), small-scale livestock keeping (mean = 2.96) and mobile/radio weather services (mean = 2.93) recorded relatively high levels of utilisation. However, irrigation (mean = 2.38), agroforestry (mean = 2.42), rainwater harvesting (mean = 2.43), integrated pest management (mean = 2.44) and climate-smart training (mean = 2.28) recorded relatively low utilisation. In terms of effectiveness, Facebook (mean = 3.09), radio (mean = 3.05), WhatsApp (mean = 3.04) and television (mean = 2.99) were perceived as effective channels for disseminating climate-smart agricultural information, while newspapers, agricultural magazines and Twitter/X were relatively less effective. The study concluded that mass media plays an important role in disseminating and providing access to climate-smart agricultural information among crop farmers, although access to information does not always translate into its utilisation. The study recommends prioritising effective media channels, integrating mass media with agricultural extension services, increasing the frequency and local relevance of agricultural programmes, and promoting underutilised climate-smart agricultural practices through targeted information dissemination and practical demonstrations.

Keywords*— Mass media, Climate-smart agriculture, Information dissemination, Information access, Crop farmers, Agricultural communication, Taraba State, Nigeria.

I. BACKGROUND OF THE STUDY

Information and communication are essential for the effective transfer of technologies designed to improve agricultural production. For farmers to benefit from such technologies, they must have access to them and learn how to effectively utilise them in their farming systems (Oyeyinka and Ajani, 2021). Mass media are useful in agricultural information dissemination because they reach wide audiences rapidly and provide farmers with information on new developments and emergencies (Food and Agriculture Organization [FAO], 2023).

Mass media refer to communication technologies such as radio, television, newspapers and digital platforms that disseminate information to broad and diverse audiences (Darji and Yadav, 2024). In agriculture, they serve as important conduits for knowledge transfer, providing information on improved crop varieties, climate-smart agricultural practices, market prices and weather forecasts. Farmers must first access and understand relevant information before effectively applying it within their farming systems (Anyanwu and Udoh, 2022; Darji and Yadav, 2024). Broadcast media, particularly community radio and television programmes, are useful in rural areas because they can overcome literacy and infrastructural barriers. Mass media also provide real-time information on weather, markets and agricultural practices, supporting farmers'

decision-making and productivity (Darji and Yadav, 2024).

Mass media remain important for reaching broad rural audiences and empowering farmers to make informed decisions (Mdoda *et al.*, 2022). Information is central to agricultural management, while radio, television and mobile platforms increasingly support extension services in developing countries (Shaikh *et al.*, 2020; Ayim *et al.*, 2022). These platforms can improve farmers' knowledge and encourage behavioural change (Rahman *et al.*, 2024). Interactive radio, mobile applications and SMS-based advisories can further educate and engage farming communities (Ayim *et al.*, 2022). Evidence also shows that radio and television are accessible and effective agricultural information channels, recording over 70% awareness and learning rates despite infrastructure and literacy constraints (Ndemdou and Fongang, 2024).

The effectiveness of mass media depends on the nature, relevance and accessibility of the information disseminated. Media-based extension is cost-effective because it reaches large audiences at relatively low per-capita cost (Posthumus *et al.*, 2025). However, mass media largely support one-way communication and provide limited or delayed feedback, which is important for effective knowledge exchange (ExtQuest, 2019). Nevertheless, they remain valuable for creating awareness and generating interest in agricultural innovations, although they cannot fully replace interactive and personalised training (Posthumus *et al.*, 2025).

Climate-smart agricultural (CSA) practices are increasingly promoted in Nigeria to address climate variability and improve food security (Obileye, 2023). These include minimum tillage, cover cropping, crop rotation, agroforestry, improved water management, rainwater harvesting, drip irrigation and drought- or flood-tolerant crop varieties. Timely information is essential for farmers to understand and apply these practices. The Systems of Rice Intensification pilot in Jigawa, Kano and Kaduna recorded a 100% yield increase and a 40% reduction in greenhouse gas emissions among over 66,000 farmers (LINKS, 2020). In Bassa, Plateau State, vegetable farmers adopted irrigation (87.8%), improved seed varieties (70.7%) and planting-date adjustments (63.6%), although 89.8% reported limited access to climate information (Onuwa *et al.*, 2024). These findings indicate the importance of information availability and accessibility in promoting CSA practices.

In Taraba State, FM radio stations, regional television and digital platforms play important roles in disseminating agricultural information. Ogunremi *et al.* (2023) found that radio and television were primary agricultural information sources, with 30% of farmers receiving information through radio and 30% through television, while internet sources accounted for only 4%. Seasonal agro-meteorological advisories on sorghum forage cultivation were disseminated through radio, including interactive sessions on Rock FM, which supported farmer sensitisation and demonstration activities in Ardo-Kola and Bali LGAs (Mdoda *et al.*, 2022). WhatsApp and Facebook are also increasingly used by extension agents to share weather alerts and agronomic information, particularly among younger farmers. A 2025 NiMet–Taraba State University partnership further strengthens the system through localised weather forecasts communicated through available media channels.

The increasing use of radio, television and digital platforms raises questions concerning the types of CSA information disseminated, the information accessed by farmers and the effectiveness of these channels. Farmers may differ in their access to media and the extent to which they obtain useful climate-smart information. Examining information disseminated, information accessed and media effectiveness is therefore necessary to understand the contribution of mass media to climate-smart agriculture among crop farmers in Taraba State. It is against this background that this study assesses the effectiveness of mass media in the dissemination of climate-smart agricultural practices among crop farmers in Taraba State, Nigeria.

Statement of the Problem

Inadequate sources of information on climate change remain a critical challenge confronting farmers in Nigeria and may continue to threaten food security (Mohammed *et al.*, 2024). Farmers' vulnerability to climate change is compounded by inadequate access to relevant and timely information, creating a need to strengthen linkages among government, subject matter specialists, extension agents and farmers through effective communication channels.

Climate change poses significant threats to agricultural productivity and livelihoods, particularly among smallholder farmers. Rising temperatures, erratic rainfall, prolonged droughts and increased pest outbreaks reduce yields, threaten food security and worsen rural poverty (FAO, 2023). These challenges require widespread dissemination and adoption of CSA practices that promote resilience, sustainability and productivity. Effective dissemination through extension services and mass media is important for ensuring access to relevant knowledge and adaptive solutions (Aker, 2021). However, effectiveness depends on the information disseminated, farmers' access to it and the ability of communication channels to convey the required knowledge.

Studies have reported varying levels of CSA adoption across Nigeria. Pelemo *et al.* (2024) found high adoption of mixed cropping (88.3%), tree planting (77.3%) and planting-date adjustments (79.8%) among arable farmers in Kogi State. Saadu *et al.* (2024) reported that 82% of smallholder farmers in northwestern Nigeria adopted various CSA practices, with positive effects on yields and incomes. However, Victory *et al.* (2022) and Shehu (2024) identified poor awareness and limited knowledge as important constraints, while Onuwa *et al.* (2024) found that 89.8% of vegetable farmers in Plateau State lacked timely climate information.

Despite these findings, existing studies have largely focused on CSA adoption, benefits and constraints without adequately examining the communication process through which farmers receive climate-smart information. Victory *et al.* (2022) and Shehu (2024), for example, identified poor awareness and limited knowledge but did not examine the types of CSA information disseminated or the communication channels involved. Similarly, Onuwa *et al.* (2024) reported inadequate access to timely climate information but did not sufficiently establish the role of mass media in disseminating such information.

The situation is particularly relevant in Taraba State, where crop farmers face changing rainfall patterns, droughts and other climate-related challenges requiring timely agricultural information. Although radio, television and digital platforms are available, limited empirical evidence exists on the specific CSA information disseminated through these channels and the extent to which farmers access it. The availability of a communication channel does not necessarily mean that it is effective, as differences in access, exposure, programme type and information relevance may affect its usefulness.

Therefore, there is a research gap concerning the role and effectiveness of mass media in disseminating climate-smart agricultural information among crop farmers in Taraba State. In particular, evidence remains limited on the CSA information disseminated by mass media, the information accessed through these channels and their effectiveness in disseminating CSA practices. The broad objective of this study is to assess the effectiveness of mass media in the dissemination of climate-smart agricultural practices among crop farmers in Taraba State, Nigeria. The specific objectives are to:

i. examine the climate-smart agricultural information disseminated to crop farmers through mass media;
ii. examine the climate-smart agricultural information accessed by crop farmers through mass media; and
iii. analyse the effectiveness of mass media in disseminating climate-smart agricultural practices among crop farmers in Taraba State.

II. METHODOLOGY

Study Area

The study was conducted in Taraba State, Nigeria, located in northeastern Nigeria between latitude 6°30′ and 9°36′ North and longitude 9°10′ and 11°50′ East (Figure 1). The state shares an international boundary with Cameroon and is bordered by Adamawa, Gombe, Bauchi, Plateau, Nasarawa and Benue States (NBS, 2021). Created on August 27, 1991, with Jalingo as its capital, Taraba covers approximately 54,473 km² and comprises 16 Local Government Areas (Federal Republic of Nigeria Official Gazette, 2007; NPC, 2006). Its diverse agro-ecological zones support extensive agricultural activities. The population was 2,300,736 in the 2006 census and was projected at about 3.6 million in 2024, with a large proportion residing in rural areas and depending on agriculture for their livelihoods (NPC, 2006; World Bank, 2022; NBS, 2023).

Agriculture is the mainstay of the state's economy and employs over 70% of the workforce. Major crops include yam, cassava, maize, rice, groundnut, millet,

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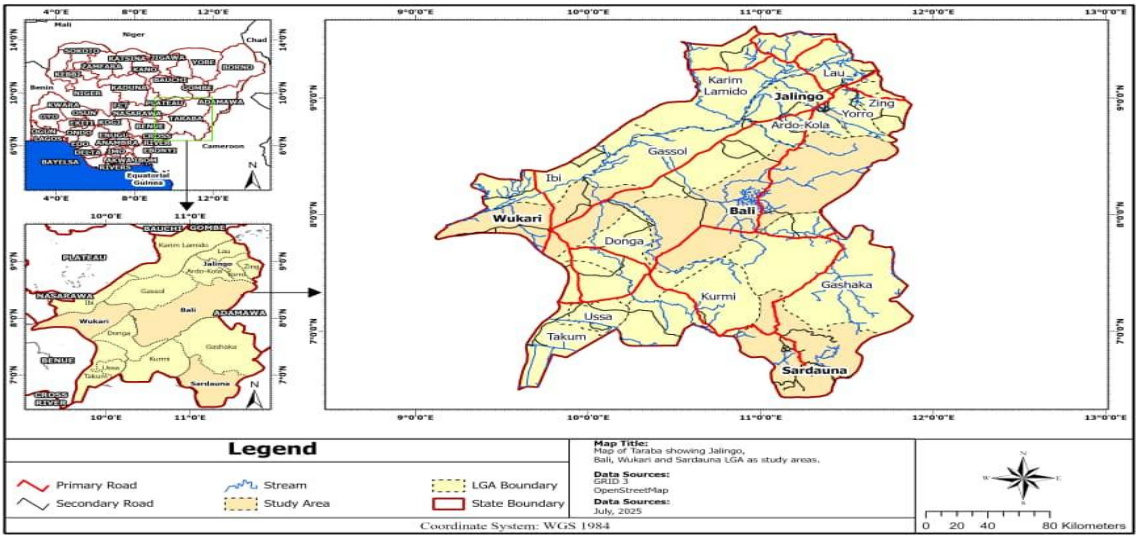
sorghum and cocoa, while cattle, goats and sheep are also widely produced (FAO, 2021; Taraba State Ministry of Agriculture, 2020). Agricultural production is increasingly affected by erratic rainfall, prolonged dry spells, flooding and soil erosion, highlighting the need for effective dissemination of climate-smart agricultural information (Ayanlade & Radeny, 2020; NEST, 2022).

Taraba State has functional mass media outlets, including Taraba State Broadcasting Service (TSBS), Taraba Television (TTV) and private FM radio stations that broadcast agricultural and climate-related programmes in English and local languages. The expansion of mobile telecommunications and social media has also improved farmers' access to agricultural information, weather forecasts, market information and climate-smart innovations (Akinyemi & Salau, 2023).

Figure 1: Map of Taraba State Showing the Study Areas



Source: GIS Lab MAU (2025)

Source and Types of Data

Primary data were used for the study and collected through questionnaires administered to farmers in the study area. The data focused on mass media use in the dissemination of climate-smart agricultural information.

Sampling Techniques and Sample Size

A multi-stage sampling procedure was adopted. First, one LGA was purposively selected from each of the four agricultural zones based on the presence of mass media stations and communication networks such as MTN, Airtel and Glo. The selected LGAs were Jalingo (Zone I), Wukari (Zone II), Bali (Zone III) and Sardauna (Zone IV).

In the second stage, three wards were purposively selected from each LGA based on proximity to urban or peri-urban centres and presence of media outlets. A pre-field visit with extension agents produced a population of 5,403 crop farmers. Using Yamane's formula (1967) at a 5% margin of error, a sample size of 372 farmers was determined.

In the third stage, proportionate random sampling was used to distribute the questionnaires according to the number of crop farmers in each selected LGA. After questionnaire administration, 351 questionnaires were retrieved, cleaned and used for analysis.

Methods of Data Analysis

Data were analysed using descriptive statistics and rating scale.

Descriptive Statistics

Frequency counts, means, standard deviations and percentages were used to summarise the socio-economic characteristics of respondents.

Rating Scale

A four-point rating scale comprising Very Effective (4), Effective (3), Moderately Effective (2) and Ineffective (1) was used to assess the effectiveness of mass media in disseminating CSA practices. Mean and standard deviation were calculated for each media channel or dissemination method. Following Farid *et al.* (2015), effectiveness was classified as low when scores were less than Mean − SD, moderate

when scores fell within Mean ± SD, and high when scores exceeded Mean + SD.

III. RESULTS AND DISCUSSION

Climate-Smart Agricultural Information Disseminated by Mass Media

Crop-smart Management Practices

The results in Table 1 show the crop-smart management practices disseminated through mass media and practised by crop farmers. Timely planting and harvesting recorded the highest practice level (85.19%), indicating that information on appropriate farm operation timing was widely received and utilised. Timely planting and harvesting help farmers respond to changing rainfall patterns and reduce crop losses. This agrees with Mbanasor *et al.* (2024), who reported widespread early planting among farmers in southeastern Nigeria. The use of recommended fertilisers (78.35%) and minimum or zero tillage (78.06%) were also widely practised, suggesting recognition of their importance for soil fertility, crop yield and soil-moisture conservation. The finding agrees with Mbanasor *et al.* (2024) and Emmanuel and Oba (2019), who identified fertiliser use and minimum tillage as important climate-smart practices.

Improved or certified seeds were used by 72.36% of respondents, indicating substantial utilisation of information on improved varieties. Such seeds can enhance productivity and withstand pests, diseases and climatic stress. This supports Mbanasor *et al.* (2024) and Emmanuel *et al.* (2025), who reported widespread use of improved and early-maturing varieties. Mulching (68.81%) and drought-tolerant varieties (68.66%) were also commonly practised, reflecting farmers' use of measures that conserve soil moisture and improve crop performance under water stress. The findings agree with Emmanuel and Oba (2019) and Mbanasor *et al.* (2024).

Crop rotation was practised by 67.52% of respondents. The practice improves soil fertility, reduces pest infestation and promotes sustainable production, supporting findings by Emmanuel *et al.* (2025) and Emmanuel and Oba (2019). Cover crops (63.53%) and organic manure (56.70%) were also practised, indicating increasing attention to soil health and environmental conservation. These findings are consistent with Mbanasor *et al.* (2024) and Emmanuel *et al.* (2025). Intercropping was the least practised crop-management measure, although 52.14% of respondents used it. Its relatively lower use may relate to management requirements or farmers' preference for practices with more immediate benefits. Overall, the findings support Eze and Onyeneke (2023) and Musa *et al.* (2024), who reported that access to agricultural and climate-smart information enhances farmers' knowledge and use of improved practices.

Table 1: Crop Management Practices

Crop Management Practices	Yes (%)	No (%)
Use of drought tolerant crop varieties	241 (68.66)	110 (31.34)
Crop rotation with legumes or cereals	237 (67.52)	114 (32.48)
Intercropping	183 (52.14)	168 (47.86)
Uses of improved or certified seeds	254 (72.36)	97 (27.64)
Timely planting and harvesting	299 (85.19)	52 (14.81)
Organic manure application	199 (56.70)	152 (43.30)
Application of recommended fertilizers	275 (78.35)	76 (21.65)
Mulching	238 (68.81)	113 (32.19)
Use of cover crops	223 (63.53)	128 (36.47)
Minimum or zero tillage practices	274 (78.06)	77 (21.94)

Source: Field survey, 2026; NB: Figures in parentheses are percentages.

Soil and Water Conservation Practices Disseminated by Mass Media

Table 2 shows varying levels of practice of soil and water conservation measures disseminated through mass media. Agroforestry was the most widely practised, with 74.93% of respondents reporting its use. Its multiple benefits, including improved soil fertility, erosion control and moisture conservation, may explain its high level of practice. The finding is consistent with Emmanuel *et al.* (2025). Ridges, bunds or contour ploughing were practised by 73.50% of respondents, indicating recognition of

their importance in reducing soil erosion and improving water infiltration. This is related to Mbanasor *et al.* (2024), who reported common use of conservation agriculture practices.

Composting crop residues was practised by 63.82%, suggesting awareness of residue recycling for soil fertility improvement. The finding agrees with Mbanasor *et al.* (2024) and Emmanuel *et al.* (2025). Organic mulching materials were used by 39.03%, while irrigation was practised by 33.33%. The relatively low levels may reflect labour, financial, technical and infrastructural constraints. Mbanasor *et al.* (2024) similarly reported limited irrigation use because of its cost and technical requirements. Rainwater harvesting recorded the lowest practice level (23.36%). Limited technical knowledge, storage facilities and financial resources may explain this result. The finding agrees with Emmanuel and Oba (2019) and supports Eze and Onyeneke (2023), who argued that access to information alone may not guarantee practice where farmers lack skills and resources.

Table 2: Soil and Water Conservation Practices

Soil and Water Conservation Practices	Yes (%)	No (%)
Use of ridges, bunds or contour plowing	258 (73.50)	93 (26.50)
Rainwater harvesting	82 (23.36)	269 (76.64)
Irrigation	117 (33.33)	234 (66.67)
Use of organic mulching materials	137 (39.03)	214 (60.97)
Agro-forestry	263 (74.93)	88 (27.07)
Composting crop residues to enrich soil	224 (63.82)	127 (36.18)

Source: Field survey, 2026. Figures in parentheses are percentages.

Pest and Disease Management Practices Disseminated by Mass Media

Table 3 shows that timely weeding and field sanitation was the most commonly reported pest and disease management practice (61.82%), followed by disease-resistant crop varieties (58.12%) and crop rotation to break pest and disease cycles (56.70%). Biological pest control was reported by 47.29%, while integrated pest management (IPM) had the lowest level at 30.77%. The findings suggest that mass media dissemination was more common for simple and familiar practices than for more technical measures such as IPM and biological pest control.

Table 3: Pests and Disease Management Practice

Pests and Disease Management Practices	Yes (%)	No (%)
Use of biological pest control	166 (47.29)	185 (52.71)
Timely weeding and field sanitation	217 (61.82)	134 (38.18)
Use of disease resistant crop varieties	204 (58.12)	147 (41.88)
Integrated pest management (IPM) techniques	108 (30.77)	243 (69.23)
Crop rotation to break pest/disease cycles	199 (56.70)	152 (43.30)

Source: Field survey, 2026. Figures in parentheses are percentages.

Climate Information and Risk Management Disseminated by Mass Media

Table 4 shows that access to weather forecasts and early warning information was the most commonly reported climate information practice, with 53.28% of respondents accessing it. This indicates an important role for mass media in providing timely information for production decisions. Musa *et al.* (2024) similarly found widespread use of weather-related mobile information services among smallholder farmers in northern Nigeria. Adjusting planting dates based on weather predictions was reported by 42.74%, suggesting that access to information did not always translate into practical decisions. Farmers' confidence in forecasts and reliance on traditional practices may contribute to this result, consistent with Eze and Onyeneke (2023).

Only 23.65% used mobile or radio weather information services. Poor network coverage, limited digital devices, low digital literacy and communication costs may constrain utilisation, supporting Musa *et al.* (2024). Participation in farmer climate-smart training was lowest at 21.08%,

possibly because of limited training opportunities and inadequate extension access. This agrees with Eze and Onyeneke (2023), who emphasised the importance of training and capacity building in effective CSA information dissemination.

Table 4: Climate Information and Risk Management

Climate Information and Risk Management	Yes (%)	No (%)
Access to weather forecast and early warning	187 (53.28)	164 (46.72)
Adjusting planting dates based on weather predictions	150 (42.74)	201 (57.26)
Use of mobile or radio weather information services	83 (23.65)	268 (76.35)
Participation in farmer climate-smart training	74 (21.08)	277 (78.92)

Source: Field survey, 2026. Figures in parentheses are percentages.

Livelihood Diversification Information

Table 5 shows the livelihood diversification information disseminated by mass media. Small-scale livestock keeping was the most widely reported activity, with 87.75% of respondents involved. This indicates that information on integrating livestock with crop production was widely received and utilised, providing additional income and resilience during crop production challenges. The finding agrees with Emmanuel *et al.* (2025), who reported 80.3% adoption of mixed farming among plantain farmers.

Off-farm income-generating activities were practised by 82.34% of respondents, showing that many farmers diversified beyond crop production to reduce dependence on farm income and improve household stability. This agrees with Mbanasor *et al.* (2024). Agro-processing was practised by 66.95%. Although lower than livestock keeping and off-farm activities, the result indicates that information on value addition and processing was utilised by a considerable proportion of farmers. Agro-processing can reduce post-harvest losses, create employment and improve farm profitability (Mbanasor *et al.*, 2024).

Table 5: Livelihood Diversification Information

Livelihood Diversification	Yes (%)	No (%)
Small-scale livestock keeping	308 (87.75)	43 (12.25)
Off-farm income-generating activities	289 (82.34)	62 (17.66)
Agro-processing	235 (66.95)	116 (33.05)

Source: Field survey, 2026. Figures in parentheses are percentages.

Level of Utilisation of Climate-Smart Agricultural Information

Table 6 presents the utilisation of CSA information using a four-point scale of high, moderate, low and not at all. A mean score of 2.50 and above was regarded as utilised, while a score below 2.50 indicated non-utilisation. Timely planting and harvesting recorded the highest mean (3.09), with 43.87% reporting high utilisation and 31.05% moderate utilisation. This agrees with Ajao *et al.* (2020), who identified early planting as one of the commonly adopted CSA practices among farmers in Oyo State. Intercropping recorded a mean of 3.01, while drought-tolerant varieties had a mean of 2.92. Their relatively high utilisation may reflect their ability to improve productivity and reduce vulnerability to erratic weather conditions, consistent with Ojo and Baiyegunhi (2020).

Crop rotation (2.89) and organic manure application (2.84) were also utilised. The findings indicate that information disseminated through mass media was translated into farm activities, supporting Ajao *et al.* (2020) and Ogundeji *et al.* (2018). Ridges, bunds or contour ploughing (2.72) and mulching (2.69) were also utilised, corroborating Amodu *et al.* (2021). Cover crops recorded a mean of 2.54 and were classified as utilised, consistent with Jalloh *et al.* (2019), who reported widespread use of cover cropping and mulching because of their compatibility with existing farming systems and low external-input requirements.

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Table 6: Level of Utilization of Climate-Smart Agricultural Information by the Respondents

Climate-Smart Practice	Mean	Remark
Use of drought tolerant crop varieties	2.92	High
Crop rotation with legumes or cereals	2.89	High
Intercropping	3.01	High
Uses of improved or certified seeds	2.43	Moderate
Timely planting and harvesting	3.09	High
Organic manure application	2.84	High
Application of recommended fertilizers	2.45	Moderate
Mulching	2.69	High
Use of cover crops	2.54	High
Minimum or zero tillage practices	2.39	Moderate
Use of ridges, bunds or contour plowing	2.72	High
Rainwater harvesting	2.43	Moderate
Irrigation	2.38	Moderate

Source: Field survey, 2026.

As further shown in Table 7, organic mulching materials (mean = 2.66) and composting crop residues (2.62) were utilised, indicating that farmers applied information relating to soil moisture conservation and soil fertility improvement. Timely weeding and field sanitation recorded a mean of 3.06, while crop rotation to break pest and disease cycles had a mean of 2.81, indicating utilisation of information on weed, pest and disease management. Adjusting planting dates based on weather predictions (2.79) and use of mobile or radio weather information services (2.93) were also utilised. This demonstrates the importance of mass media in providing climate-related information for production decisions. Small-scale livestock keeping (2.96) and off-farm income-generating activities (2.89) were also utilised, showing the contribution of livelihood diversification information to income and risk management.

However, some practices were not utilised. Agroforestry recorded a mean of 2.42, disease-resistant varieties 2.45, IPM 2.44, access to weather forecasts and early warning 2.36, farmer climate-smart training 2.28 and agro-processing 2.37. This suggests limited application of information relating to these practices. Overall, farmers made greater use of information relating to practices that were affordable, easy to implement and capable of providing immediate benefits, including timely weeding, organic mulching, composting, crop rotation, weather information services, livestock keeping and off-farm activities. Practices requiring greater technical knowledge, financial resources or institutional support recorded lower utilisation. This agrees with Mbanasor *et al.* (2024) and Musa *et al.* (2024), who identified financial constraints, inadequate training, poor information services and weak communication infrastructure as barriers to utilisation.

Table 7: Level of Utilization of Climate-Smart Agricultural Information by the Respondents Continued

Climate-Smart Practice	Mean	Remark
Use of organic mulching materials	2.66	High
Agro-forestry	2.42	Moderate
Composting crop residues to enrich soil	2.62	High
Use of biological pest control	2.32	Moderate
Timely weeding and field sanitation	3.06	High
Use of disease resistant crop varieties	2.45	Moderate
Integrated pest management (IPM) techniques	2.44	Moderate
Crop rotation to break pest/disease cycles	2.81	High
Access to weather forecast and early warning	2.36	Not Utilized
Adjusting planting dates based on weather predictions	2.79	Utilized
Use of mobile or radio weather information services	2.93	Utilized
Participation in farmer climate-smart training	2.28	Moderate

Small-scale livestock keeping	2.96	High
Off-farm income-generating activities	2.89	High
Agro-processing	2.37	Moderate

Source: Field survey, 2026.

Effectiveness of Mass Media in Disseminating Climate-Smart Agricultural Practices

Effectiveness of mass media refers to the ability of communication channels to successfully disseminate information to the target audience in ways that enhance awareness, understanding and utilisation. Table 8 presents the effectiveness of various mass media platforms in disseminating CSA practices among crop farmers. Facebook was perceived as the most effective platform, with a mean score of 3.09; 45.01% rated it very effective and 27.92% effective. Its effectiveness may be associated with interactive features and timely access to agricultural content. This supports Ogbonna *et al.* (2018), who reported that interactive communication channels improve farmers' access to climate-related information and recommended practices.

Radio recorded a mean of 3.05 and was classified as effective, with 40.46% rating it very effective and 33.62% effective. Its wide coverage, affordability and use of local languages may explain its effectiveness. The finding agrees with Yahaya (2022) and Okwu *et al.* (2021), who identified radio as an effective channel for agricultural and climate-smart information dissemination. WhatsApp recorded a mean of 3.04 and was also effective, with 43.02% rating it very effective and 28.77% effective. Its rapid information-sharing and interactive features may explain its effectiveness, supporting Ogbonna *et al.* (2018).

Television recorded a mean of 2.99 and was classified as effective. About 38.75% rated it very effective and 32.48% effective. Its combination of visual and audio demonstrations may enhance farmers' understanding of CSA practices. This agrees with Nwankwo *et al.* (2016) and Salau *et al.* (2014), although irregular electricity supply may constrain television access. Community announcement boards (2.71), YouTube (2.55) and agricultural shows/expos (2.54) were also classified as effective. Their usefulness may be related to visual demonstrations and opportunities for interaction, consistent with Okon and Nwachukwu (2015).

Newspapers recorded a mean of 2.32 and were classified as ineffective. Literacy requirements, limited circulation and rural accessibility may explain the result, supporting Salau *et al.* (2014). Twitter (X) also recorded a low mean of 2.25, possibly because of limited access or engagement. This agrees with Ogbonna *et al.* (2018), who noted that communication effectiveness depends on accessibility, familiarity and frequency of use. Agricultural magazines recorded the lowest mean (2.20) and were classified as ineffective. Limited circulation and accessibility may account for the result. Okwu *et al.* (2011) similarly found that print media were less effective than radio and television because rural farmers had limited access to printed materials and often preferred audio-based communication.

Table 8: Effectiveness of Mass Media in Disseminating Climate-Smart Agricultural Practices

Mass Media Platform	Very Effective	Effective	Moderately Effective	Ineffective	Mean	Remark
Radio	142 (40.46)	118 (33.62)	56 (15.95)	35 (9.97)	3.05	Effective
Television	136 (38.75)	114 (32.48)	63 (17.95)	38 (10.83)	2.99	Effective
Newspaper	61 (17.38)	89 (25.36)	102 (29.06)	99 (28.21)	2.32	Ineffective
Agricultural Magazines	48 (13.68)	85 (24.22)	107 (30.48)	111 (31.62)	2.20	Ineffective
WhatsApp	151 (43.02)	101 (28.77)	61 (17.38)	38 (10.83)	3.04	Effective
Facebook	158 (45.01)	98 (27.92)	57 (16.24)	38 (10.83)	3.09	Effective
Twitter (X)	54 (15.38)	87 (24.79)	104 (29.63)	106 (30.20)	2.25	Ineffective
YouTube	83 (23.65)	103 (29.34)	90 (25.64)	75 (21.37)	2.55	Effective
Agricultural Shows/Expos	71 (20.23)	95 (21.07)	74 (21.08)	111 (31.62)	2.35	Ineffective

Community Announcement Boards	95 (27.07)	118 (33.62)	80 (22.79)	58 (16.52)	2.71	Effective

Source: Field survey, 2026. Figures in parentheses are percentages.

IV. CONCLUSION

The study concluded that mass media plays an important role in the dissemination and access to climate-smart agricultural information among crop farmers in Taraba State. The findings revealed that information on practices such as timely planting and harvesting, recommended fertiliser application, minimum or zero tillage, improved seeds, mulching, drought-tolerant varieties and crop rotation was widely disseminated and accessed. However, the utilisation of more technical and resource-intensive practices, including agroforestry, irrigation, rainwater harvesting, integrated pest management, climate-smart training and agro-processing, remained relatively low. The study further showed that the effectiveness of mass media varied across channels, with Facebook, radio, WhatsApp, television, community announcement boards and YouTube perceived as effective, while newspapers, agricultural magazines and Twitter (X) were relatively less effective.

V. RECOMMENDATIONS

The following recommendations were made:

i. Taraba State Ministry of Agriculture and Food Security, Taraba State Agricultural Development Programme (TADP), and relevant development partners should prioritise effective mass media channels such as radio, television, Facebook and WhatsApp for disseminating climate-smart agricultural information to crop farmers.

ii. Taraba State Agricultural Development Programme (TADP), agricultural extension agencies and development organisations should integrate mass media with agricultural extension services to improve farmers' access to and understanding of climate-smart agricultural information.

iii. Taraba State Broadcasting Service (TSBS), television and radio stations, and agricultural extension agencies should increase the frequency, consistency and local relevance of agricultural programmes, including the use of local languages and farmer-centred content.

iv. Taraba State Ministry of Agriculture and Food Security, TADP, research institutions and development partners should promote underutilised climate-smart agricultural practices such as agroforestry, irrigation, rainwater harvesting and integrated pest management through practical demonstrations, field-based learning and targeted media programmes.

CONFLICT OF INTEREST

The Authors declares no conflict of interest

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