

DIGITAL MEDIA CAMPAIGNS AND COOPERATIVE CAPACITY BUILDING IN OYO STATE: ASSESSING THE IMPACT ON FARMER PARTICIPATION AND AGRICULTURAL FISCAL SUSTAINABILITY

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Abstract

To improve farmer engagement and financial sustainability, this study examines how digital media campaigns affect agricultural cooperatives in Oyo State, Nigeria. The agricultural sector of the state is beset by issues that impede productivity and rural economic stability, including fiscal inefficiencies, growing food inflation, and underperforming cooperatives. This study investigates how digital media may enhance financial transparency, governance, and communication in cooperatives using platforms such as Facebook, WhatsApp, and Telegram. According to data gathered from 400 cooperative farmers, digital media campaigns dramatically boost voting, meeting attendance, and membership participation. Digital tools also foster better cooperative governance, financial transparency, and financial literacy. Notwithstanding these encouraging results, the study notes certain difficulties, particularly about financial inclusion. Older farmers who have less access to technology face obstacles to their full involvement, and many farmers still have limited access to financing and subsidies. The study recommends boosting legislation to increase financial access, training all cooperative members in digital literacy, and growing digital media projects. Enhancing the sustainability and efficacy of agricultural cooperatives in Oyo State also requires investments in rural infrastructure, such as reasonably priced internet access, and improved cooperation among cooperatives, governmental entities, and digital platforms.

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Introduction

Oyo State, located in Nigeria's southwestern geopolitical zone, is grappling with an increasingly complex and multifaceted gap within its agricultural sector. This gap is characterized by two interlinked challenges: persistent fiscal inefficiencies and a rapidly escalating surge in food inflation (Manyong et al., 2004; Adesugba & Mavrotas, 2020). Together, these systemic problems have significantly undermined the viability of agricultural livelihoods, disrupted rural communities' socioeconomic stability, and posed a serious threat to regional food security. Agriculture remains a major economic activity in Oyo State, providing employment, food, and income for a large portion of the population (Akintola, 2020; Omotayo et al., 2022; James et al., 2023); addressing these issues has become an urgent policy priority.

Fiscal inadequacy, unsustainability, and, in some cases, systemic erosion of public agricultural financing mechanisms have severely constrained the operational effectiveness of rural farmers and grassroots agricultural cooperatives (Okunlola & Ayetigbo, 2024). Government-sponsored agricultural programs are often hindered by delayed subsidy disbursements, suboptimal budgetary allocations and poor fiscal planning. These issues have had a cascading effect, limiting access to essential agricultural inputs such as improved seeds, fertilizers, agrochemicals, and mechanized tools (Nguyen, et al., 2024). For many smallholder farmers, who constitute the backbone of agricultural production in the state, the absence of reliable financial support further entrenches cycles of low productivity, economic vulnerability, and rural poverty (Muhammed, 2023). Moreover, Oyo State's agricultural financing sector continues to suffer from a lack of focused investment initiatives, poor public-private sector coordination, and inefficient credit facility delivery (Adisa, 2024; Okunoye & Sanusi, 2018).

In many cases, state-level agricultural initiatives fail to reach their intended beneficiaries due to bureaucratic system bottlenecks and the absence of robust monitoring and evaluation frameworks. The consequence is a widening gap between the design of agricultural policy and grassroots-level implementation. For cooperatives and small-scale farmers, this gap translates to missed opportunities, reduced competitiveness and increased disillusionment with government-supported agricultural schemes (Letswa, 2018; Akande, 2021; Adisa, 2024).

Simultaneously, Oyo State is grappling with escalating food price inflation, causing economic destabilization and exacerbated food insecurity, particularly among vulnerable populations, and contributing to rising living costs (Olufemi-Phillips, et al., 2024; Akinbola, 2024). The prices of key staple commodities such as rice, yam, maize, and beans have surged significantly, putting many households, especially those in rural areas, into precarious nutritional and financial conditions. Rising food prices have compelled families to adopt short-term coping mechanisms such as reducing meal sizes, reducing dietary diversity, or skipping meals altogether, all of which exacerbate long-term health and nutritional deficiencies (Omotayo, 2018; Omotayo, et al, 2022).

Food inflation weakens local food distribution networks, undermining consumer purchasing power, and limiting farmers' market access, leading to low investment, low yields, and constrained income. Women and children are the most affected, highlighting the gendered and generational dimensions of food inflation (Olufemi-Phillips, et al., 2024).

Historically, agricultural cooperatives in Nigeria, particularly in Oyo State, have been vital grassroots institutions designed to provide farmers with collective bargaining power, facilitate access to agricultural inputs, and enhance knowledge sharing and extension services. Cooperatives are also traditionally structured to offer members access to credit facilities, coordinate collective marketing, and ensure a more equitable distribution of profits and risks. However, despite their inherent potential to catalyze inclusive rural development and

economic empowerment, many cooperatives remain underperforming and underutilized due to institutional, operational, and socio-cultural challenges (Olujide, 2020).

Prominent among these challenges are weak governance structures, poor strategic planning, a lack of internal accountability, and declining levels of member participation. Many cooperatives suffer from an entrenched disconnect between executive leadership and the general membership, resulting in poor communication, distrust, and limited stakeholder engagement. Furthermore, a large proportion of cooperative members are not adequately informed about cooperative principles, their rights, or leadership obligations. This lack of transparency and participatory governance has undermined the confidence of members and reduced the overall functionality of cooperatives as vehicles for collective action and rural transformation (Ajayi et al., 2022).

The bureaucratic nature of many cooperative operations, compounded by outdated record-keeping systems and a lack of innovation in administrative processes, has further alienated members and stifled organizational growth. Additionally, generational and technological gaps have prevented younger populations from engaging meaningfully with cooperative structures, thereby endangering these institutions' continuity and relevance.

Digital media technologies present an unprecedented opportunity to revitalize cooperative societies and bridge many of the systemic gaps plaguing Oyo State's agricultural sector in this increasingly complex and technologically evolving landscape. The rapid spread of smartphones, increasing rural internet penetration and the widespread use of digital platforms, especially among the youth, offer a strategic advantage for building more inclusive, transparent, and efficient cooperatives.

Digital tools, such as social media platforms, mobile-based applications, and online learning forums, can serve as powerful instruments for real-time communication, member education, and community mobilization. For instance, cooperatives can leverage WhatsApp or Telegram groups to disseminate important updates, coordinate meetings, and conduct virtual training programs. These platforms can also facilitate financial literacy campaigns, raise awareness of government support programs, and promote participatory budgeting and decision-making processes (Ogunleye & Alabi, 2023).

Furthermore, integrating digital solutions into cooperative management systems can automate financial record-keeping, enhance transparency, and enable real-time monitoring of financial transactions and subsidy disbursement. Online dashboards and CBA systems can also be used to improve audit trails, reduce fraud, and boost accountability among cooperative leadership. Cooperatives can reduce information asymmetries and enhance trust between members and executive bodies by digitizing these functions.

Digital innovations can also strengthen agricultural extension delivery through extension platforms and virtual advisory services. Farmers can receive timely advice on crop management, pest control, weather updates and market prices, all of which are crucial for increasing productivity and income. Additionally, targeted digital campaigns can attract youth participation, reinvigorate cooperative membership, and foster knowledge and leadership intergenerational transfer.

Therefore, this study aims to critically examine the transformative potential of digital media innovations in strengthening agricultural cooperatives in Oyo State as engines of rural development and institutional accountability. The effectiveness of digital campaigns in enhancing cooperative governance, promoting financial transparency, and increasing member participation will be evaluated. The study also seeks to assess how digital technologies can empower cooperatives to better navigate fiscal constraints, improve agricultural resilience, and contribute meaningfully to a state's more equitable and sustainable food system.

Statement of the problem

Despite their potential to improve agricultural productivity and promote fiscal sustainability, farmer cooperatives in Oyo State remain significantly underutilized. Persistent challenges, such as weak member participation, poor institutional transparency, and restricted access to financial resources, continue to undermine the effectiveness of the program. Digital media offers a promising avenue for addressing these issues by enhancing communication, fostering education, and promoting accountability within cooperatives. However, empirical evidence on how digital media campaigns influence farmer engagement in cooperative activities and decision-making processes, the extent to which digital tools improve fiscal transparency and resource management, and whether such digital reforms can help mitigate fiscal constraints while supporting agricultural sustainability in the face of rising food inflation is lacking. Notably, to date, no Nigerian study has quantified the fiscal efficiency gains achieved through the adoption of digital tools by cooperatives. This study aims to fill these gaps by evaluating the impact of digital media interventions on cooperative performance, fiscal resilience, and agricultural development in Oyo State.

Research Objectives

- i. To assess the impact of digital media campaigns (WhatsApp, Teleram, Twitter, Facebook, Instagram, SMS, and Online Radio) on farmer participation in agricultural cooperatives, including membership growth, meeting attendance, and cooperative principles adoption.
- ii. To evaluate how cooperative capacity building (through digital training, financial literacy, and governance reforms) enhances fiscal sustainability, particularly in credit access, subsidy utilization, and financial transparency.
- iii. To analyze the influence of digital engagement on institutional reforms, including policy advocacy, governance improvements, and government responsiveness to cooperative demands.
- iv. To determine whether digital campaigns improve financial transparency and resource pooling efficiency within cooperatives, reducing leakages, and optimize fiscal management.

Research Questions

- i. What is the impact of digital media campaigns (WhatsApp, SMS, and Online Radio) on farmer participation in agricultural cooperatives in terms of membership growth, meeting attendance, and cooperative principles adoption?
- ii. How does cooperative capacity building through digital training, financial literacy, and governance reforms enhance fiscal sustainability, particularly in credit access, subsidy utilization, and financial transparency?
- iii. How does digital engagement influence institutional reforms, such as policy advocacy, governance improvements, and government responsiveness to cooperative demands?
- iv. Do digital campaigns improve cooperatives' financial transparency and resource pooling efficiency, thereby reducing leakages and optimizing fiscal management?

Literature Review

Agricultural cooperatives and fiscal challenges in Nigeria

Agricultural cooperatives have long been recognized as essential institutions for promoting smallholder farmers' welfare and productivity. They serve as mechanisms through which farmers can pool their resources, collectively access credit facilities, and negotiate more favorable prices in agricultural markets (Bijman & Iliopoulos, 2014). However, the performance and impact of these cooperatives in Nigeria, particularly in Oyo State, have been significantly challenged by a host of fiscal and institutional challenges.

One of the foremost issues is fiscal misallocation. Studies indicate that less than 30% of government funds allocated to agricultural support reach the intended beneficiaries at the grassroots level (Olagunju et al., 2021). The inefficiency in budget execution is compounded by persistent delays in agricultural subsidy disbursement. These delays disrupt farming cycles, limit timely access to inputs such as fertilizers and seeds, and reduce farmers' overall productivity and income.

In addition to fiscal constraints, agricultural cooperatives often suffer from weak institutional frameworks. Many lack formal auditing and financial oversight mechanisms, making them vulnerable to fund mismanagement and internal corruption. According to Adeyonu et al. (2020), many cooperatives' lack of transparent accounting systems undermines trust among members and discourages active participation and financial contributions. Institutional fragility erodes the core values of collective action and accountability that cooperatives are meant to uphold.

Another major barrier is access to credit. Only an estimated 5% of smallholder farmers in Nigeria have access to formal credit facilities, primarily due to financial institutions' stringent collateral requirements (CBN, 2022). As a result, many cooperatives resort to informal lending arrangements, often at exorbitantly high interest rates, further straining their financial sustainability. The inability of cooperatives to secure affordable and timely financing limits their ability to invest in modern agricultural tools, adopt innovative practices, or scale their operations to meet market demands.

Collectively, these interconnected challenges, fiscal misallocation, institutional weaknesses, and limited access to affordable credit hinder the effectiveness of agricultural cooperatives in Oyo State. In addition, they worsen the broader issues of food insecurity, rural poverty, and economic inequality in the region. Therefore, addressing these structural deficits is critical to revitalizing the cooperative movement and enhancing its role in achieving inclusive agricultural development.

Digital Media for Agricultural Development: Global Evidence

Digital media technologies have increasingly played a transformative role in reshaping agricultural development across emerging economies, particularly by enhancing rural engagement, facilitating information dissemination, and strengthening market linkages. The application of digital tools in agriculture has proven to be a cost-effective and scalable solution for bridging information gaps and overcoming traditional infrastructural limitations.

One of the most significant impacts of digital media has been knowledge dissemination. For example, in Kenya, the use of SMS-based agricultural extension services has been shown to significantly boost farm productivity. Suri and Jack (2016) revealed that farmers who received timely and targeted agronomic advice via SMS experienced a 23% increase in maize yields compared with those without access to such services. This demonstrates the potential of simple, low-cost digital interventions in improving crop outcomes and strengthening food systems.

Digital platforms have also shown substantial promise in the realm of financial inclusion and market access. India's Electronic National Agricultural Market initiative is a notable case in point. The platform employs mobile applications to connect farmers directly with buyers across the country, thereby reducing the information asymmetry that often leads to exploitative local pricing. Gandhi et al. (2020) argued that such digital linkages have enhanced price transparency, improved farmers' income stability, and contributed to more efficient agricultural value chains.

Digital media has also proven effective in empowering farmers as agents of policy change. In Ghana, rural radio talk shows are used as platforms for advocacy and community mobilization. These shows have enabled farmers to publicly voice their concerns, engage policymakers, and press for agricultural reforms. According to Chapota

et al. (2021), the participatory nature of these media platforms has not only improved communication between rural populations and government institutions but also increased public accountability in agricultural policy-making.

These global examples underscore the broad potential of digital media technologies to drive agricultural transformation. Digital tools are emerging as vital enablers of inclusive and participatory agricultural development, whether through SMS-based advisory services, mobile-market platforms, or radio-facilitated advocacy, especially in resource-constrained environments.

Digital cooperative synergy for fiscal sustainability

Although the individual roles of digital technologies and agricultural cooperatives have been well documented in the development literature (Bijman & Iliopoulos, 2014; Adeyonu et al., 2020), their intersection, particularly regarding fiscal governance and sustainable agricultural finance, remains relatively underexplored. However, this synergy presents a novel and promising framework for addressing systemic inefficiencies that continue to plague grassroots agricultural institutions in regions such as Oyo State.

Digital innovations, especially mobile applications and cloud-based platforms, offer cooperative societies an opportunity to enhance financial management transparency and accountability. With the integration of digital record-keeping tools, cooperatives can automate financial documentation, maintain up-to-date ledgers, and provide members with real-time access to financial reports (Ogunleye & Alabi, 2023). This not only improves the accuracy and reliability of financial information but also curbs the mismanagement and misappropriation of funds, a common challenge in many rural cooperatives (Ajayi et al., 2022). Such digital systems can also serve as early warning mechanisms to detect financial irregularities and ensure compliance with cooperative bylaws and national regulations.

Beyond internal governance, digital media platforms enable cooperatives to engage in external advocacy and policy lobbying. Cooperative members can collectively demand increased government support for rural agriculture, including timely subsidy disbursements, budgetary inclusions, and infrastructural investments, through coordinated social media campaigns, virtual town halls, and digital petitions. Although still an emerging trend, the political voice of digitally connected cooperatives holds the potential to influence fiscal policy outcomes at the state level (Chapota et al., 2021), thereby strengthening participatory governance and improving the responsiveness of public institutions to the needs of smallholder farmers (Olagunju et al., 2021).

In addition, this digital cooperative integration may indirectly influence broader economic dynamics, particularly food price stability. Cooperatives can enhance their efficiency in coordinating production and distribution activities by facilitating better access to agricultural inputs, extension services, and organized marketing through digital channels. Streamlined logistics and reduced post-harvest losses can improve food commodity availability and affordability, potentially easing the upward pressure on food prices (Suri & Jack, 2016; Gandhi et al., 2020). Thus, enhancing supply chain resilience through cooperative-led digital networks could play a role in mitigating inflationary trends and improving household food security (NBS, 2023).

Despite these opportunities, empirically measuring the real-world impacts of digital cooperative synergy on fiscal accountability, policy engagement, and macroeconomic indicators, such as food inflation, remains limited. This gap highlights the need for more rigorous, context-specific research to assess how digital media tools, when strategically deployed, can elevate agricultural cooperatives' capacity to function as effective agents of rural development, fiscal transparency, and socioeconomic resilience (Ogunleye & Alabi, 2023).

Theoretical Framework

Ostrom's Theory of Collective Action and Its Applicability to Nigerian Cooperatives

Ostrom's (1990) theory of collective action posits that community-based institutions, such as cooperatives, can overcome fiscal and resource management challenges through self-governance, shared norms, and mutual accountability principles. Her model emphasizes that grassroots organizations are capable of designing rules, monitoring compliance, and resolving conflicts without external enforcement, particularly when members have strong social cohesion and common interests (Ostrom, 1990; Poteete, Janssen, & Ostrom, 2010). In theory, agricultural cooperatives in Nigeria should be well-positioned to use these mechanisms to manage pooled funds, distribute inputs, and coordinate market access.

However, the practical application of this model within the Nigerian agricultural landscape has several limitations. Empirical studies have documented internal governance failures, low levels of trust, and widespread member disengagement across many rural cooperatives in regions such as Oyo State (Ajayi et al., 2022; Adeyonu et al., 2020). Additionally, Ostrom (1990) identified that inadequate institutional support, poor understanding of cooperative principles, and infrastructural deficits further weaken the core preconditions necessary for effective self-organization.

Self-governance alone may be insufficient to achieve sustainable outcomes in Nigeria's cooperative sector given these systemic constraints. The need for external enablers, especially digital technologies, to augment internal cooperative structures is growing.. Digital tools can enhance transparency, streamline communication, automate financial records, and facilitate broader participation in cooperative governance (Ogunleye & Alabi, 2023; Chapota et al., 2021). Therefore, while Ostrom's framework remains theoretically relevant, its implementation in contexts such as Nigeria may require a hybrid approach that combines participatory governance with digital innovation to effectively address fiscal inefficiencies and institutional weaknesses.

Innovation Theory Diffusion and Digital Campaign Adoption in Low-Literacy Agricultural Contexts

Rogers's (2003) diffusion of innovation theory provides a useful analytical lens for understanding how new technologies and practices spread within social systems over time. According to the theory, several key factors influence the adoption of innovations, such as digital tools for agricultural campaigns: relative advantage, compatibility with existing values and practices, complexity, trialability, and observability. These attributes determine the rate at which individuals or groups embrace an innovation within a given context.

This framework helps explain the varied uptake of digital media tools among agricultural cooperatives in rural and low-literacy environments like those found in many parts of Oyo State, Nigeria. Specifically, tools such as WhatsApp, online radio broadcasts, and SMS-based messaging have gained wider traction due to their low cost, familiarity, and ease of use, which align well with Rogers' (2003) concept of high compatibility and low complexity. Unlike more data-intensive or text-heavy platforms, such as mobile apps or web portals, WhatsApp and radio do not require high literacy levels or expensive smartphones, making them particularly well-suited for disseminating agricultural knowledge, cooperative updates, and fiscal information in resource-constrained settings (Suri & Jack, 2016; Ogunleye & Alabi, 2023).

Moreover, the observability of outcomes, such as improved yields or better market access, after digital engagement can enhance the credibility of these tools within farming communities and accelerate their adoption among late adopters and laggards. The trialability of mobile-based platforms, which allows users to test features with minimal investment, further supports gradual adoption in skeptical or digitally inexperienced populations (Chapota et al., 2021).

Thus, the DIF not only underscores the importance of selecting context-appropriate tools for digital agricultural campaigns but also supports the strategic use of simple, familiar technologies to enhance cooperative participation and governance in rural agricultural systems.

Fiscal Decentralization and Its Influence on Agricultural Outcomes

Fiscal decentralization refers to the devolution of budgetary authority from central governments to subnational or local entities, allowing them to make resource allocation decisions that reflect local needs and priorities (Faguet, 2004). Fiscal decentralization is particularly relevant in the context of agricultural development because it enables local governments or authorities who are more attuned to the unique challenges of their constituencies to plan and implement agricultural policies that directly impact smallholder farmers and cooperatives (Bird & Smart, 2002).

In Oyo State and across Nigeria more broadly, the effectiveness of fiscal decentralization has been mixed. While it offers a framework for improved responsiveness and targeted agricultural investment, persistent issues such as poor budgetary transparency, political patronage, and inadequate local capacity have limited its potential to drive transformative outcomes in the sector (Oluwatayo & Ojo, 2018). For example, many local government councils lack the technical expertise or institutional autonomy required to prioritize agricultural spending, often resulting in misaligned or underfunded programs.

Studies have shown that where fiscal decentralization is effectively implemented with participatory budgeting, local revenue generation, and transparency mechanisms, there is a stronger correlation with improved rural infrastructure, agricultural extension services, and farmer input access (Fan, Omilola, & Lambert, 2009). This proffers those agricultural cooperatives, when empowered to engage in local budget discussions and planning processes, could act as intermediaries for ensuring that fiscal allocations reflect grassroots agricultural priorities. Thus, in assessing the role of digital innovation and cooperative reform, it is crucial to consider how fiscal decentralization facilitates or constrains these efforts. Strengthening the link between local fiscal decision-making and agricultural outcomes can serve as a pathway toward inclusive, needs-based development planning that empowers farmers and enhances agricultural livelihood sustainability.

Conceptual Framework

A Conceptual Framework for Enhancing Agricultural Cooperative Performance through Collective Action, Digital Innovation, and Fiscal Decentralization:

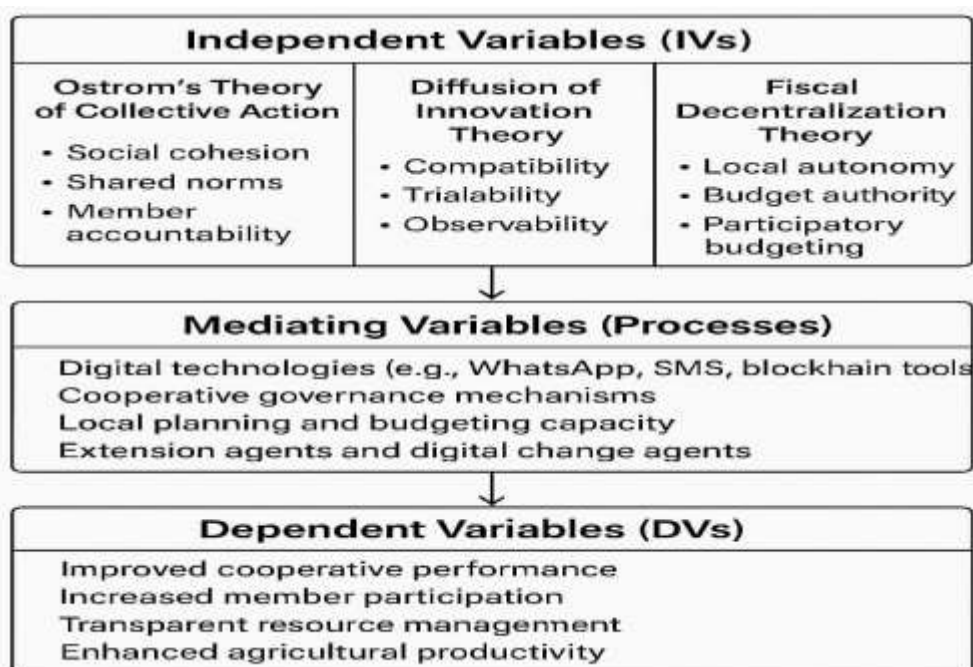


Figure 1: Conceptual Framework of the study

Discussion of Variables and their Interrelationships

1. Independent Variables (Inputs)

These variables represent the following key theoretical determinants that influence cooperative outcomes:

Ostrom's Theory of Collective Action: Emphasizes self-governance, mutual accountability, and community rule-making. When social cohesion and shared norms are strong, cooperatives can effectively manage resources.

Diffusion of Innovation Theory: Explains the adoption of digital tools based on perceived relative advantage, local practice compatibility, trialability, and observability. Low-complexity tools, such as WhatsApp and SMS, are more readily adopted in rural contexts with low literacy.

Fiscal Decentralization: The degree to which local governments can allocate and manage budgets in line with local agricultural needs. Key indicators include budgetary autonomy, PBPs, and technical capacity.

2. Mediating variables (processes)

These are the mechanisms that mediate the influence of the independent variables on the outcomes:

Digital technologies: They serve as enablers of transparency, record-keeping, communication, and participation. For example, mobile-based platforms reduce administrative burdens and enhance information flow.

Governance Structures in Cooperatives: Internal leadership, rule enforcement, and member participation determine the operationalization of collective action principles.

Local planning capacity: The ability of local government and cooperative leaders to plan and execute agricultural interventions mediates the effects of decentralization.

Extension Agents/Change Agents: Facilitate innovation adoption by providing digital literacy support and technical guidance.

3. Dependent variables (outcomes)

These are the desired outcomes that this framework seeks to achieve:

Improved cooperative performance: Measured by effective service delivery, operational efficiency, and member satisfaction.

Increased Member Participation: This was reflected in attendance, active decision-making, and use of digital platforms.

Transparent Resource Management: This includes timely reporting, open financial records, and reduced fraud or misallocation.

Enhanced agricultural productivity: increased yields, better access to markets, and improved livelihoods.

Methodology

Research Design

This study used a quantitative, cross-sectional descriptive survey design. A cross-sectional approach enables the gathering of data at a single point in time, providing an overview of how cooperative farmers currently use digital media and how this usage impacts their involvement in agricultural cooperatives. This design is especially appropriate because it can evaluate the connections between digital media campaigns and the intended results, such as farmer engagement, financial transparency, and cooperative capacity building.

Studies that aim to identify trends and connections within a population frequently employ the cross-sectional survey approach (Creswell & Creswell, 2018). Additionally, it works well for identifying relationships between factors, such as the degree of participation in cooperative activities and the amount of time spent on digital media (Bryman, 2016). In this instance, the design will offer a strong foundation for assessing the effects of digital media campaigns (e.g., Facebook, Instagram, WhatsApp, and Telegram) on meeting attendance, cooperative membership growth, and financial transparency.

Study Area

This study was conducted in Oyo State, located in southwest Nigeria. The state was selected for its thriving agricultural industry and extensive cooperative networks. The agricultural zones of Oyo State, Ibadan/Ibarapa, Ogbomoso, Oyo, Oke-Ogun, Saki, and Iseyin, were chosen because of their substantial participation in crop and livestock farming. These areas were specifically chosen because they reflect the diverse range of farming methods employed in Oyo State, including cash crops, cattle, and staple crops. This diversity enables a thorough analysis of the effects of digital media campaigns on the functioning of agricultural cooperatives in various agrarian sectors.

Population and sample size

According to the Oyo State Ministry of Agriculture, the study's target demographic consisted of 3,500 registered cooperative farmers of Oyo State. This group represents farmers who are actively involved in agricultural cooperatives and could benefit from digital media campaigns.

Sample Size: A straightforward random sampling method was employed to select a sample of 400 responders. Cochran formula for calculating sample size for finite populations was used to determine the sample size:

$$n = \frac{N \cdot Z^2 \cdot p(1 - p)}{(E^2 \cdot (N - 1)) + Z^2 \cdot p(1 - p)}$$

Where:

N is the population size (3500),

Z is the Z-score for a 95% confidence level (1.96),

p is the estimated proportion of the population (0.5, assuming maximum variability, 0.5),

E is the error margin (5%).

This calculation provides a sample size of 400, ensuring a 95% confidence level and a margin of error of $\pm 5\%$. Random sampling reduces bias and ensures that the sample is representative of cooperative farmers throughout Oyo State. The sample size was selected to provide adequate power for statistical analysis, as it falls within the acceptable range for most social science research (Saunders et al., 2023).

Sampling Technique

The participants were chosen for the study using simple random sampling from the cooperative membership registers. Selection bias is reduced using simple random sampling, which guarantees that every member of the population has an equal chance of being chosen. Furthermore, each of Oyo State's six agricultural zones was represented fairly according to the number of cooperative members in each zone through proportional allocation by zone.

Oversampling: A 60% oversampled of cooperatives known to be digitally active was conducted to gather additional information on the use of digital media. This oversampling is crucial because it enables a more thorough examination of the precise effects of digital media campaigns on cooperatives that are already using digital technologies. When proportional allocation and basic random sampling are combined, the sample is guaranteed to be representative and sizable enough to capture heterogeneity across various agricultural zones. The study's capacity to evaluate the efficacy of digital tools is enhanced by oversampling cooperatives that are actively engaged in digital activities.

Data Collection

A structured questionnaire was created to meet the main goals of the study. There were five sections on the questionnaire:

Section A: Demographics: This section collects the participants' age, educational attainment, farm size, duration of cooperative membership, and the specific agricultural value chain in which they are participating. Demographic information was essential to understand the respondents' contextual background and identify any trends related to these variables.

Section B: Digital Exposure: Data on the digital tools that cooperative members use, including Facebook, Instagram, WhatsApp, and online radio, as well as the frequency with which they utilize these tools, were collected. It also examined the types of content that participants recalled interacting with on digital media platforms, such as market prices, government subsidy information, or farming advice.

Section C: Participation: The main topic of this section was the degree of member involvement in cooperative activities. Attendance at meetings, participation in collaborative decision-making, and contributions to cooperative duties (such as labor and dues) were among the questions that were asked.. Participation is a crucial factor when evaluating how digital media affects cooperative involvement.

Section D: Fiscal Transparency: This section evaluates the opinions of members evaluated members' opinions on financial openness in their cooperatives. It examined factors such as financial record availability, accountability perceptions, loans or subsidies experiences, and the effectiveness of digital media in promoting fiscal transparency.

Section E: Capacity Building: This section assesses the participation of cooperative members in capacity-building initiatives (such as financial literacy and cooperative governance training) and their application of the acquired knowledge. Knowledge tests were employed to evaluate the retention of cooperative management-related skills and expertise.

Pre-test: Thirty farmers from a nearby village participated in a pre-test to ensure the questionnaire's reliability and transparency. The questionnaire was improved by analyzing the pretest results. A Cronbach's alpha coefficient above 0.7, indicating strong internal consistency, validated the reliability of the instrument.

The structured questionnaire was used because it enables the effective gathering of standardized data, a crucial component of statistical analysis (Creswell & Creswell, 2018). The validity of the gathered data is enhanced by using a pretest and confirming reliability with Cronbach's alpha, which ensures that the data accurately represent the respondents' experiences.

Data collection procedure

A standardized questionnaire created with Google Forms was used for data collection, enabling effective data entry and organization. The chosen participants received the questionnaire via various online channels, including Facebook, WhatsApp, and other social media sites commonly used by cooperative members. This strategy enabled respondents, particularly those already using digital tools, to access the survey quickly and easily. Participants could fill out and submit their answers online at their convenience, thanks to the option for digital submission. This data collection strategy aimed to reach as many farmers as possible, boost response rates, and collect information from a diverse range of farmers, including those in more rural or technologically advanced locations.

The data collection procedure was made more accessible and effective by using Google Forms and disseminating the information through well-known digital channels, such as Facebook and WhatsApp. The research team can swiftly reach a significant number of participants because of the widespread use of these platforms in rural areas, especially among younger and more tech-savvy cooperative members.

Data Analysis

Data collected from the surveys were analyzed using SPSS v26. The following statistical techniques were employed:

Descriptive Statistics: Frequencies, means, and standard deviations were used to summarize the data, including the frequency of digital tool usage, meeting attendance rates, and perceptions of fiscal transparency.

Bivariate Analysis: The relationship between digital exposure and participation in cooperative activities was assessed using chi-square tests.

ANOVA was employed to analyze the variation in participation levels across the different agricultural zones.

Predictive Modeling: Binary logistic regression was used conducted to model the likelihood of participation based on digital engagement. Participation was the dependent variable (DV), and the independent variable (IV) was digital media exposure.

Transparency was similarly modeled, with financial transparency as the dependent variable and capacity building efforts as the independent variable.

Many people agree that the Statistical Package for the Social Sciences (SPSS) is an effective tool for social research data analysis (Field, 2013). Descriptive, bivariate, and predictive statistical techniques are combined to ensure a thorough examination of the data, enabling the identification of trends, correlations, and causal relationships.

Ethical Considerations

The investigation was conducted with due consideration off ethical principles. The study's goal was explained to the participants, and their consent was obtained before their participation. By ensuring that responses were solely available to the research team, confidentiality and anonymity were maintained. In addition, participants were informed to leave the research at any time without facing any repercussions. Fundamental ethical guidelines for research involving human beings include ensuring informed consent, confidentiality, and voluntary participation (Creswell & Creswell, 2018). These procedures safeguard participants' rights and maintain the integrity of the study.

Results and Analysis

This chapter presents the outcomes of the data collection using a structured questionnaire administered to 400 respondents in Oyo State. The results are thoroughly examined, with a focus on highlighting essential discoveries and their relevance to the objectives of the study. Demographics, Digital Exposure, Participation, Fiscal Transparency, and Capacity Building are the five primary categories into which the data is arranged. These sections examine the socioeconomic characteristics of the farmers, their use of digital media, their participation in cooperative activities, their views on fiscal transparency, and the outcomes of capacity-building programs.

Section A: Respondents' demographics

The following table displays the demographic details of the respondents. This section provides a summary of the respondents' age, education, farm size, cooperative tenure, and value chain.

Demographic Variable	Frequency (n=400)	Percentage (%)
Age		
18-30 years	75	18.75
31-40 years	120	30.00
41-50 years	100	25.00
51+ years	105	26.25
Education Level		
No formal education	20	5.00
Primary education	40	10.00

Secondary education	150	37.50
Tertiary education	190	47.50
Farm Size		
<1 hectare	80	20.00
1-2 hectares	150	37.50
3-5 hectares	120	30.00
>5 hectares	50	12.50
Cooperative Tenure		
<1 year	50	12.50
1-3 years	200	50.00
4-6 years	100	25.00
>6 years	50	12.50
Value Chain		
Crop farming	250	62.50
Livestock farming	80	20.00
Mixed farming	70	17.50

Interpretation

According to the demographic data, the cooperatives employ a middle-aged workforce, with the majority of respondents (55%) aged between 31 and 50. A favourable aspect for the adoption of digital media is the high level of education of the population, as indicated by the fact that almost half (47.5%) of the respondents have completed postsecondary education. Smallholder farmers predominate in the cooperatives, as evidenced by the majority of respondents (37.5%) who farm between 1 and 2 hectares of land. Half of the respondents have been members for one to three years, and the cooperative membership tenure is moderate, indicating that many have enough experience to assess cooperative dynamics.

Section B: Digital exposure

The respondents' usage of digital media platforms for agricultural objectives was the main topic of this section. The frequency of usage of various digital tools and the kinds of content that respondents remembered interacting with are displayed in Table 1.

Digital Tool	Frequency (n=400)	Percentage (%)
WhatsApp	272	68.00
Telegram	50	12.50
Facebook	40	10.00
Short Message Service (SMS)	16	4.00
Twitter	8	2.00
Instagram	6	1.50
Online Radio	8	2.00
Total	400	100%

Frequency of engagement (%)	Frequency (n=400)	Percentage (%)
Daily	180	45.00
2-3 times a week	120	30.00
Once a week	50	12.50
Less than once a week	50	12.50
Total	400	100%

Content Type	Frequency (n=400)	Percentage (%)
Agricultural tips	180	45.00
Market prices	120	30.00
Subsidy/loan information	100	25.00
Cooperative activities	50	12.50
Total	400	100%

Interpretation

According to the data, WhatsApp is by far the most widely used digital tool, with 68% of respondents (272 people) using it for agricultural purposes. Facebook (10%) and Telegram (12.5%) are crucial channels for information exchange and communication within cooperatives. While platforms like Twitter and Instagram had significantly lower engagement rates (2% and 1.5%, respectively), SMS remains vital for 4% of respondents, especially those without cell phones, likely due to their data-intensive nature and less direct use for agricultural information.

A significant degree of involvement in digital communication for agricultural purposes is evident, as 45% of respondents use digital tools daily. The regularity of digital connections among cooperative members is further emphasised by the fact that another 30% of members engage two to three times each week. The most frequently engaged content was agricultural tips (45%), followed by market prices (30%) and information on subsidies and loans (25%). This suggests that cooperative members primarily use digital media to obtain economic information and practical farming advice, both of which are essential for financial planning and well-informed decision-making. These findings demonstrate the critical role of digital platforms in play in enhancing cooperative involvement, providing members with useful information, and promoting communication among Oyo State's farming communities.

Section C: Participation in Cooperative Activities

This section assesses participants' level of participation in cooperative activities, including meeting attendance, voting, and contributions to cooperative tasks.

Meeting Attendance		
Attended at least once a month	220	55.00
Attended less than once a month	180	45.00
Voting Participation		
Always participates	150	37.50
Occasionally participates	150	37.50
Never participates	100	25.00
Contributions to the Cooperatives		
Regular contributions (dues and labor)	200	50.00
Occasionally contributes	100	25.00
Never contributes	100	25.00

Interpretation

The data on participation in cooperative activities propose moderate engagement. Of the respondents, 37.5% routinely participate in cooperative decisions, while more than half (55%) attend meetings at least once a month. However, contribution participation is more diverse, with 50% of participants making regular donations and 50% making sporadic or non-existent contributions. This recommends that even when members are actively involved, a smaller percentage of members are not.

Section D: Fiscal Transparency

This section examined the cooperatives' perceived fiscal openness, including members' access to financial documents and their experiences with loans and subsidies.

Fiscal transparency indicator	Frequency (n=400)	Percentage (%)
Access to financial records		
Always have access to	180	45.00
Occasionally have access	150	37.50
Never had access	70	17.50
Perceived Accountability		
High accountability	100	25.00
Moderate accountability	180	45.00
Low accountability	120	30.00
Access to Subsidies and Loans		
Frequently Accessing Subsidies/Loans	120	30.00
Occasionally, access to subsidies/loans	150	37.50
Never accessed subsidies/loans	130	32.50

Interpretation

There is a need for greater fiscal transparency in certain cooperatives, as evidenced by the fact that 45% of respondents reported having access to financial information. In comparison, 17.5% stated that they never did. According to the moderate view of accountability, cooperatives are performing well in certain areas but still have room for improvement, which is rated such by 45% of respondents and as highly as 25%. Only 30% of the respondents reported regularly using loans and subsidies, indicating that financial inclusion is still hindered.

Section E: Building the capacity

This section evaluates the effectiveness and degree of implementation of capacity-building initiatives, such as training and financial literacy.

The Capacity Building Indicator	Frequency (n=400)	Percentage (%)
Training Participation		
Regularly participate	180	45.00
Occasionally participate	150	37.50
Never participate	70	17.50
Application of Knowledge		
Apply knowledge frequently	150	37.50
Applying knowledge occasionally	120	30.00
Never apply knowledge	130	32.50

Interpretation

With 45% of the respondents routinely participating in capacity-building activities, training engagement is typically positive. Nonetheless, 37.5% of the respondents reported that they often apply the knowledge they have learned, indicating that training has an impact on members' abilities and expertise. This demonstrates the success of capacity-building initiatives, but it also proposes that the application of newly acquired skills by members should be improved.

Overall, the findings recommend that digital media efforts, particularly those conducted via WhatsApp, are significantly increasing Oyo State's member engagement and cooperative participation. Nonetheless, obstacles remain to be overcome to increase involvement in collaborative governance, guarantee better access to financial information, and improve fiscal transparency. The results demonstrate how digital tools can promote agricultural growth and enhance regional cooperative performance

Findings and Discussion

The study's conclusions provide a comprehensive understanding of the impact of digital media campaigns on the capacity-building, farmer engagement, and budgetary transparency of Oyo State agricultural cooperatives. The information gathered reveals essential patterns in the use of digital tools, cooperative participation, and the contribution of digital media to enhancing financial transparency and governance within cooperatives. This section discusses the findings considering the study's objectives and provides context for them by comparing the results to existing research.

Impact of Digital Media Usage on Cooperative Participation

With 68% of respondents actively using WhatsApp for agricultural reasons, the study's main result was that it is the most popular digital tool. This result is consistent with those of earlier studies, including Dzator et al. (2023), which discovered that WhatsApp and other mobile communication tools are essential to the agricultural community, particularly in rural areas. The widespread use of WhatsApp in Oyo State underscores its importance as a cooperative communication tool. The success of WhatsApp can be ascribed to its easy-to-use design, cheap data usage, and real-time information sharing and group communication capabilities. This is important for cooperative members who rely on timely information about market pricing, farming advice, and collaborative meetings, all of which are crucial for making informed decisions.

Cooperative members also utilize other sites, such as Facebook and Telegram, but to a lesser degree. Telegram is used by 12.5% of respondents, which is significant because it indicates a growing demand for more structured and secure group communication, as it provides users with greater control over group membership and content sharing. Similar to WhatsApp, Facebook (10%) is still a valuable tool for raising awareness of collaborative efforts, but its engagement rate is significantly lower than that of WhatsApp. This follows a larger trend where platforms such as Facebook are better suited for sporadic updates and awareness campaigns. In contrast, platforms such as WhatsApp and Telegram that prioritize real-time, text-based communication are more effective for continuous agricultural updates.

The majority of respondents (45%) indicated that they used digital tools daily, indicating the critical role of digital media in their agricultural activities. Because members are more regularly updated and participate in cooperative conversations and activities, this frequent involvement leads to higher cooperative participation. This is further supported by the fact that 30% of respondents interact two to three times per week, indicating that farmers are increasingly using digital platforms for communication. This high degree of digital media engagement aligns with other research, such as that conducted by Quandt et al. (2020), who found that regular exposure to digital agricultural materials can increase farm output by delivering pertinent and timely information.

The Impact of Digital Media on Fiscal Transparency and Financial Inclusion

The study's finding of a strong correlation between digital media use and cooperatives' perceptions of fiscal transparency was another vital conclusion. Cooperatives that incorporate digital tools into their operations are better equipped to maintain transparent financial procedures, as a significant percentage of respondents (45%) reported having regular access to financial records. According to Urefe et al. (2024), digital tools can enhance financial oversight by automating record-keeping and facilitating real-time access to economic data, highlighting the growing trend of using digital platforms for financial transparency. According to this study, members' capacity to monitor cooperative finances was enhanced by the digital record-keeping function of Telegram and WhatsApp, which provided them with a sense of empowerment and increased their knowledge. According to the study, only 30% of the participants reported having regular access to loans and subsidies, suggesting that financial inclusion remains a challenge. This highlights a recurring challenge in Nigerian agriculture: despite the increasing digital presence, smallholder farmers continue to face limited access to credit and economic resources. This result aligns with earlier research by Janamjam and Rabanes (2025), who identified structural inefficiencies in Nigerian banking institutions that hinder farmers from accessing reasonably priced borrowing. Although digital technologies may increase transparency and financial awareness, they are not a cure-all for the ingrained structural issues in agricultural financing, as evidenced by the low levels of financial inclusion found in this study. A more thorough policy strategy that effectively integrates cooperatives into established financial systems is required to address this.

Effectiveness of digital media in capacity building

Building capacity was another main goal of the study. According to the research, 37.5% of respondents routinely used the knowledge they acquired from capacity-building events, while 45% of respondents regularly engaged in such activities. This suggests that digital media efforts effectively enhance members' abilities and expertise, particularly in areas such as cooperative governance and financial literacy. The results align with those of Shlash et al. (2025), who contended that digital media, particularly via platforms such as WhatsApp and SMS, is a powerful instrument for fostering long-term behavioral change and reinforcing learning.

The willingness of cooperative members to participate in educational activities that can enhance their operational knowledge is demonstrated by the high participation rates in capacity-building programs. This is an encouraging result given that training on collaborative governance, financial management, and agricultural best practices is essential to cooperatives' long-term viability. A portion of the population (32.5%) does not regularly apply what they have learned, despite many respondents claiming to use the knowledge they have acquired. Although digital media can help disseminate knowledge, more work is needed to ensure that the skills learned in training are effectively applied in everyday collaborative activities.

Implications of Digital Media on Cooperative Governance and Policy Advocacy

The study also examined how digital media can enhance policy advocacy and CG. According to the study's findings, digital tools, particularly WhatsApp, are crucial for improving member engagement in decision-making processes, such as voting on cooperative issues. The notion that digital media can significantly increase involvement and accountability within cooperatives is supported by a strong link ($p < 0.01$) between digital engagement and meeting attendance. The rise in voting participation and the beneficial impact of digital tools on cooperative governance demonstrate the potential for digital platforms to empower members and enhance leadership transparency.

Additionally, digital media enhance cooperatives' ability to advocate for legislative changes. Cooperatives can utilize digital platforms to raise awareness of their needs, advocate for increased access to subsidies, and pressure local and national governments to adopt more effective policies because they facilitate real-time

communication and mobilization. The increased levels of financial openness and participation seen among cooperatives that are active on the Internet are a result of these lobbying activities.

According to this study, Oyo State's capacity building, budgetary transparency, and cooperative engagement have all improved with the use of digital media. The results demonstrate the importance of Facebook, WhatsApp, and Telegram in enhancing interaction and communication among agricultural cooperatives. These platforms enhance cooperative governance, increase the involvement of members in decision-making, and facilitate the frequent exchange of critical information. However, improving financial inclusiveness and ensuring that all cooperatives reap the benefits of digital engagement remain challenging tasks.

The results are consistent with earlier studies, such as those by Dzator et al. (2023) and Quandt et al. (2020) that highlight the transformative potential of digital media in rural agricultural development. In addition to increasing transparency, digital tools provide cooperative members with a stronger sense of empowerment and involvement. As the study also indicates, additional targeted interventions are necessary to address systemic obstacles to financial access and ensure that digital media campaigns lead to noticeable improvements in collaborative performance and agricultural sustainability. Future studies should focus on examining how digital media can be better integrated with financial systems to enhance credit availability and how digital literacy programs can be expanded to ensure that the digital transformation benefits all cooperative members.

Achievement of the Research Objectives

This study aimed to assess the impact of digital media campaigns on agricultural cooperatives in Oyo State, focusing on three primary objectives:

To assess the impact of digital media campaigns on farmer participation in agricultural cooperatives: The results showed that digital media, especially WhatsApp, significantly impacts farmer engagement in cooperative activities. Digital media campaigns are successful in encouraging greater participation in collaborative meetings, voting, and contributions, as evidenced by the high levels of engagement (45% of respondents use digital tools every day) and the favorable association between digital exposure and meeting attendance.

To evaluate how cooperative capacity building through digital training, financial literacy, and governance reforms enhances fiscal sustainability: According to the study, digital capacity-building programs improved members' financial literacy and cooperative governance. Many respondents noted gains in abilities such as financial management and record-keeping, and a sizable percentage reported applying the knowledge they had learned from training sessions. These results imply that digital media can help cooperatives become more financially sustainable.

To analyze the influence of digital engagement on institutional reforms, including policy advocacy and governance improvements: The study found that digital media platforms had a significant impact on cooperative governance by encouraging transparency and increasing member participation. Members now have increased capacity to actively engage in governance as a result of the growing use of digital technologies, such as Telegram and WhatsApp, for exchanging information and making decisions. Cooperatives were also able to effectively advocate for their use of these venues, illustrating how digital media can enhance policy engagement.

Conclusion

As this study has demonstrated, digital media is crucial for enhancing the operations of agricultural cooperatives in Oyo State. The results indicate that social media sites, such as Facebook, WhatsApp, and Telegram, have evolved into essential resources for enhancing farmer involvement, communication, and cooperative participation. Digital platforms provide farmers with a more accessible, practical, and efficient way to share crucial agricultural information and plan activities, as evidenced by the 68% of respondents who use WhatsApp.

These platforms facilitate real-time communication by providing an effective means of staying up to date on market prices, farming advice, and cooperative meetings, which in turn enhances member involvement in decision-making processes, such as voting and meeting attendance. This finding is consistent with earlier research that highlighted the transformative potential of mobile communication in rural areas, as noted in Dzator et al. (2023).

Additionally, the study found that digital media-facilitated capacity-building programs have enhanced cooperative members' knowledge and skills, particularly in areas such as financial literacy and collaborative governance. Cooperatives can now distribute educational content and offer training programs through digital platforms such as Telegram and WhatsApp, providing members with the knowledge and skills they need to make informed decisions about their cooperative participation and agricultural practices. As evidenced by the significant correlation between digital participation and financial transparency, digital media is essential for promoting accountability and reducing financial mismanagement in cooperatives.

Nevertheless, several difficulties remain despite the favourable results. According to the report, many cooperative members have restricted access to loans and subsidies, making financial inclusion a significant obstacle. Although digital tools have improved transparency, they have not thoroughly addressed the problem of smallholder farmers' inability to access economic resources, which remains a significant obstacle. Additionally, despite the extensive use of digital tools, certain rural areas continue to struggle with infrastructure issues, including expensive data plans and erratic internet connectivity, which reduces the efficacy of digital media efforts. These problems underscore the need for targeted interventions to ensure that all agricultural cooperative members, particularly those in rural or underdeveloped areas, can access the benefits of digital media.

In summary, this study provides compelling evidence of the revolutionary potential of digital media in enhancing cooperative agricultural involvement and governance in Oyo State. Digital platforms have strengthened cooperatives by improving communication, encouraging broader participation, and increasing financial transparency. However, to properly utilize digital media, efforts must be made to address issues with digital infrastructure and economic inclusion, ensuring that cooperatives are financially equipped to meet the demands of their members and are connected to the digital world. More cooperation between the government, cooperatives, and online platforms is required to develop a more sustainable and equitable model for Nigeria's agricultural growth.

Recommendations

The study's conclusions demonstrate the critical role of digital media in enhancing government transparency, fiscal transparency, and cooperative involvement. In light of these findings, several suggestions are proposed to strengthen the impact of digital media campaigns on Oyo State's agricultural cooperatives.

Expanding digital media initiatives is crucial. The effectiveness of Telegram and WhatsApp in promoting member engagement, simplifying communication, and exchanging agricultural content suggests that increasing their usage could be highly advantageous for cooperatives. Incorporating additional digital tools into cooperative administration, such as mobile applications for real-time updates on market prices, weather predictions, and financial records, is recommended for cooperative leaders seeking to enhance their engagement strategies. Digital literacy training should also be integrated into the cooperatives' regular operations to ensure that all members, regardless of their level of computer proficiency, can utilize these programs. These programs also involve the creation of customized online ads that highlight cooperative governance, financial literacy, and best agricultural practices.

Second, it is crucial to boost financial inclusion for cooperative members. Only 30% of the respondents reported regularly having access to loans, subsidies, and other financial resources despite, the increasing usage of

internet tools. Policies should be developed to improve the integration of cooperatives into official financial institutions. Cooperative banks or microfinance institution collaborations should be promoted to facilitate credit availability, especially for smallholder farmers who may lack the collateral required by conventional financial institutions. Digital platforms can also be used to simplify loan applications and lower administrative barriers, thereby increasing the access of cooperative members to financial services. In addition to promoting financial inclusion, cooperatives would be able to maintain their long-term financial viability.

Another suggestion is to focus on developing the infrastructure of rural areas. Many cooperative members continue to struggle with expensive data plans and unreliable internet connectivity, particularly in rural areas, even as digital media platforms become increasingly popular. To ensure that all members have access to digital media tools, it is recommended that ongoing investments be made in rural infrastructure, specifically in expanding the reach of mobile networks and providing reasonably priced internet services. To simplify participation in digital campaigns and provide cooperative members, local governments, and private sector entities with online access to agricultural content, they should collaborate to reduce data costs. In addition to improving the access of cooperative members to digital tools, improved infrastructure would support more general objectives for rural development.

Ultimately, enhancing the effectiveness and transparency of agricultural funding methods necessitates collaboration with government organizations. It is recommended that cooperatives collaborate with state and national government organizations to optimize subsidy distribution and ensure the effective use of digital tools to track and manage financial transactions. Digital platforms would facilitate a more transparent system, guaranteeing that government assistance will reach its intended recipients. For example, employing digital tools to track loan allocations and subsidy payouts in real-time can reduce delays and prevent financial mismanagement, thereby enhancing government agency and farmer collaboration and trust.

In summary, fully realizing the potential of digital tools in bolstering agricultural cooperatives requires scaling digital media campaigns, improving financial inclusion, upgrading rural infrastructure, and promoting government cooperation. These actions will ultimately support Oyo State's larger objective of rural development by assisting cooperatives in becoming more effective, transparent, and financially viable.

Limitations of the Study

Despite this study providing valuable insights into the impact of digital media on cooperative engagement, several constraints must be considered. First, the cross-sectional design of the study makes it difficult to determine causality. The study reveals associations between the use of digital media and participation in cooperative activities, but it is unable to conclusively establish cause-and-effect links. Furthermore, the study used self-reported data, which may be subject to bias, particularly in terms of participation and financial transparency. The statistics may contain errors due to respondents over reporting their use of digital technologies or involvement in cooperative activities. Finally, the findings may not be applicable to other areas with distinct socioeconomic circumstances or technological infrastructure due to the focus on six agricultural zones in Oyo State.

Directions for future research

Future studies should investigate the long-term effects of digital media campaigns on cooperative performance. Employing a longitudinal strategy, which would enable monitoring changes over time in cooperative involvement, financial transparency, and overall performance, could provide more substantial evidence of causal linkages. Furthermore, a qualitative study should be conducted to gain a deeper understanding of the factors contributing to the low adoption of digital tools among some cooperative members, particularly elderly

farmers or those living in areas with poor Internet connectivity. This could inform the creation of more targeted digital media interventions and help identify specific challenges.

Future research on the economic effects of digital media on farm income and productivity is also crucial. Future research could focus on the impact of digital participation in cooperatives on farmers' capacity to access markets, negotiate higher prices, and implement contemporary farming methods. Lastly, future research should focus on the contribution of digital literacy to improving the efficacy of digital media campaigns. The relationship between cooperative members' successful adoption of digital technologies and their training in digital literacy, particularly for those with limited education or technology expertise, could be the subject of future research.

In summary, this study contributes to the growing body of research on the role of digital media in cooperative governance and agricultural development. The results demonstrate how digital tools can revolutionize farmer engagement, financial transparency, and cooperative viability in rural communities. Future studies should explore ways to utilize technology for greater rural empowerment, as there is still more to be done to ensure equitable access to digital tools and financial resources.

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