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Socioeconomic Factors and Challenges Affecting Adoption of Extension Strategies among Rural Farmers in Calabar South Local Government Area, Cross River State, Nigeria

***[1]Effiong, J.B., [2]Azu, S.B., [1]Ekpenyong, U.C., & [1]Etim, O. U.**
[1]Department of Agricultural Extension and Rural Sociology, University of Calabar, Calabar, Nigeria
[2]Department of Agricultural Education, University of Calabar, Calabar, Nigeria

***Corresponding author email:** johneffiong090@gmail.com

Abstract
This research examined the socioeconomic factors and challenges affecting the adoption of extension strategies among rural farmers in Calabar South L.G.A. of Cross River State, Nigeria**.** The study specifically explored the socioeconomic attributes of the respondents and the obstacles they encountered in implementing these strategies. The target population comprised all crop farmers in the region, and a two-stage sampling method was used to select 110 participants. Data collection was conducted through structured questionnaires, while descriptive statistical tools such as frequency distributions, percentages, means, and rankings were employed for analysis. Results indicated that females constituted the majority (54.5%) of respondents, 42.7% were aged between 31 and 40 years, and 54.5% were married. Additionally, 53.6% had attained secondary education, 49.1% had household sizes ranging from 1 to 5 members, 34.5% had farming experience spanning 1 to 5 years, and 49.1% reported monthly earnings above ₦20,000. The primary challenge identified was limited access to information, with a mean score of $\bar{x}$=2.38. The study concluded that; although farmers in the study area possess relatively diverse socioeconomic characteristics, including moderate education levels and farming experience, the highlighted constraints do however, limit the effective adoption of innovations essential for improving productivity and livelihoods. The study recommended that government and agricultural stakeholders should improve access to agricultural information through community-based communication hubs, mobile technologies, and regular engagement with farmers to bridge the knowledge gap.

Keywords: Socioeconomic Factors, Extension Strategies, Adoption in Agricultural Extension

Introduction

Agricultural extension strategies are essential tools for promoting sustainable farming, enhancing crop yields, and ensuring farmers have access to up-to-date knowledge and technologies. These strategies serve as a link between agricultural research institutions and rural communities, ensuring that innovations reach those working on the ground. Both public and private sectors, as well as NGOs, are often involved in delivering these services to help farmers make informed decisions (Munyua, 2013). Among the commonly applied methods are Farmer Field Schools (FFS), which encourage hands-on learning and decision-making based on real-time field observations. Similarly, demonstration farms are used to showcase the benefits of improved agricultural techniques in a practical setting. In recent years, the use of information and communication technologies (ICTs)—like mobile messaging, radio programs, and farming apps—has expanded, allowing for quicker and more targeted information sharing, especially in areas with better access to digital tools. Effective extension work often involves a combination of approaches to meet the diverse needs of farmers. For example, peer learning through model farmers can be paired with broader outreach via media campaigns and training events (Hailemichael, 2013; Ijeoma & Adesope, 2015; Ijioma et al., 2014). The effectiveness of these strategies relies on community involvement, an understanding of local conditions, and flexibility in delivery methods. When well-implemented, agricultural extension programs can greatly improve food production, increase resilience to climate change, and uplift rural livelihoods (Iwena, 2018).

A good knowledge of socioeconomic factors within an agrarian population is crucial to the development and success of extension services. A good grasp of factors affecting the adoption of agricultural innovation through extension services is imperative to agricultural development (Effiong et al., 2016). Several studies highlight the

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importance of socioeconomic factors in determining the extent to which rural farmers adopt extension strategies. Aboh and Effiong (2019a) explored the adoption of weed management techniques among cocoa farmers, revealing that financial constraints, literacy levels, and land tenure systems significantly influence adoption rates. Similarly, their study on vegetable production (Aboh & Effiong, 2019b) which underscores the role of farming as a critical component of food security, with extension strategies serving as a bridge between knowledge and practice. Also, Aker (2011) examined the role of information and communication technologies (ICTs) in agricultural extension, emphasizing that mobile technology can help overcome barriers such as distance and lack of access to extension agents. However, he noted that low literacy levels and affordability of mobile devices still pose challenges to widespread adoption. Effiong and Aboh (2024) assessed the effectiveness of agricultural extension models in food crop production, highlighting the need for localized extension strategies tailored to farmers' socioeconomic realities. Additionally, Effiong et al. (2024) analyzed the impact of road infrastructure on food sovereignty, demonstrating that poor road conditions hinder the effective dissemination of agricultural knowledge. In a related study, Effiong and Etim (2024) explored the utilization of plastic materials in agricultural production among agro-enterprise owners in the Southern Agricultural Zone of Cross River State, noting that economic factors influence the adoption of innovative farming materials. Their findings was similar to that of Effiong and Iheme (2024) who examined the effectiveness of new media technologies in agricultural production, underscoring the role of digital communication in facilitating farmer education (Etim & Effiong, 2024).

The effectiveness of extension services is hindered by multiple constraints. Several authors have indicated various constraints including Ayanwuyi et al. (2013) who identified poor funding, inadequate staffing, and limited training opportunities as major impediments to agricultural extension services in Kwara State, Nigeria. Likewise, Baig and Aldosari (2013) analyzed extension service constraints in Asia, finding that weak institutional frameworks and insufficient government support negatively impact extension efforts. In Ethiopia, Birhanu et al. (2019) used a propensity score matching analysis to demonstrate how agricultural extension services enhance productivity among smallholder farmers. However, they also pointed out that inequitable access to extension services results in disparities in adoption rates. Similarly, Codjoe et al. (2013) found that cocoa farmers in Ghana face challenges related to inefficient agricultural knowledge and information systems, which hinder the effective dissemination of extension strategies. Effiong and Asikong (2013) conducted a mid-term assessment of the Fadama III Development Project in Cross River State, identifying bureaucratic inefficiencies and inadequate infrastructure as significant obstacles to the success of extension programs. Furthermore, Effiong et al. (2021) explored farmers' perceptions of vegetable production in Yakurr LGA, emphasizing the importance of socioeconomic incentives in promoting sustainable agricultural practices.

Infrastructure, including road networks and market accessibility, plays a pivotal role in the effectiveness of extension services. Dercon et al.(2008) analyzed the impact of agricultural extension and road development on poverty reduction in Ethiopia. Their findings suggest that improved infrastructure enhances access to extension services, thereby facilitating higher adoption rates among rural farmers. Effiong (2024a) examined the influence of socioeconomic variables and extension inhibitors on food sovereignty in Akwa Ibom State, highlighting the role of policy frameworks in mitigating structural barriers (Etim & Effiong, 2022). Omotayo (2015) discussed ICT integration in agricultural extension, highlighting that policymakers must prioritize digital literacy and access to affordable technology. Likewise, Munyua (2013) emphasized the gender dimensions of agricultural extension services, noting that policy frameworks should consider female farmers' unique challenges in accessing extension programs.

Effiong (2012) highlights the role of youth participation in community development in Yakurr Local Government Area. Youth engagement in agricultural activities is essential for sustaining agricultural extension programs (Effiong & Effiong, 2012). However, limited access to resources and employment opportunities hinders their active involvement. Effiong and Aboh (2018) discuss how rubber production technologies are influenced by the socioeconomic environment in Akwa Ibom State, positing that farmers' financial constraints, limited credit access, and lack of investment in modern agricultural technologies limit their ability to adopt recommended extension strategies. Effiong et al. (2024) examine the impact of road infrastructure on food sovereignty. Poor transportation infrastructure restricts farmers' ability to access markets and extension services, thereby reducing the adoption of new agricultural techniques. Other studies such as, Effiong et al. (2021) explored farmers' perceptions of vegetable farming and its contributions to livelihoods. Cultural attitudes and traditional farming practices influence farmers' willingness to adopt modern agricultural extension recommendations. Effiong (2013) highlights the challenges rural women face in agricultural production,

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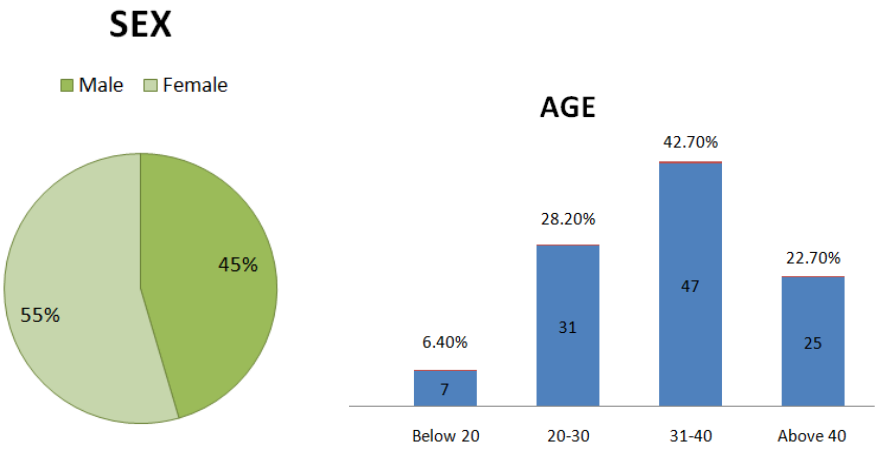
including limited land ownership and lower access to extension services. Addressing gender disparities is critical for improving the adoption of agricultural extension strategies. Effiong and Aboh (2024) analyze the effectiveness of agricultural extension models in food crop production in Cross River State. Inefficiencies in extension service delivery, including inadequate staffing and funding, reduce the impact of these programs. Etim et al. (2022) discuss the impact of climate change on agricultural production. Variability in weather patterns affects farmers' willingness to adopt new farming techniques due to perceived risks and uncertainties. Effiong (2024b) discusses how socioeconomic variables and extension inhibitors affect food sovereignty. Poor policy implementation and lack of incentives for farmers create barriers to agricultural extension adoption. The aim of the study was to explore the socioeconomic attributes of the respondents and the obstacles they encounter in implementing agricultural extension strategies.

Materials And Methods

The study was carried out in Calabar South Local Government Area, located in Cross River State, Nigeria which lies between latitudes 5º32' and 4º27' North and longitudes 7º50' and 9º28' East of the Greenwich meridian. It has a tropical humid climate with wet and dry seasons and average temperature ranging between 15ºC – 30ºC and annual rainfall between 1300 – 3000mm. The Southern Agricultural Zone has seven blocks which are; Calabar South, Akampka, Calabar Municipality, Biase, Akpabuyo, Bakassi, and Odukpani. The vegetation are; Mangrove, Swamp, and Rainforest. Major crops produced in the area includes; Cocoa, Rice, Cassava, Oil Palm, Rubber, Banana and Pineapple among others (Effiong et al., 2023). Occupation is mostly farming, marketing and civil services. The population of study included all crop farmers in Calabar South Local Government Area of Cross River State, Nigeria (Nkang & Effiong, 2015). A two-stage sampling method was used: five cells were purposively selected based on the level of agricultural activity, and 22 farmers were randomly chosen from each cell, yielding a total of 110 respondents. Primary data was gathered through structured questionnaires and analyzed using descriptive statistics, such as percentages and mean scores. The constraints faced by farmers in implementing extension strategies were assessed using a 4-point Likert scale, with responses ranging from strongly agree to strongly disagree.

Results

1. **Socioeconomic Characteristics of Respondents**



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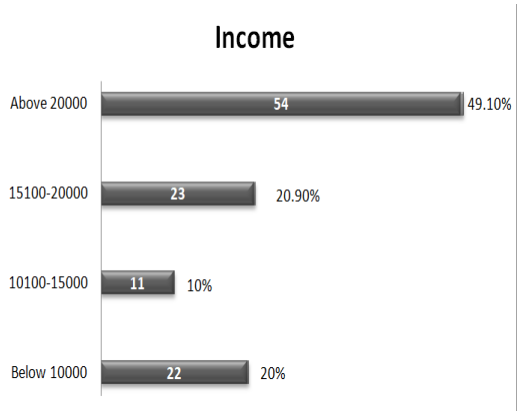

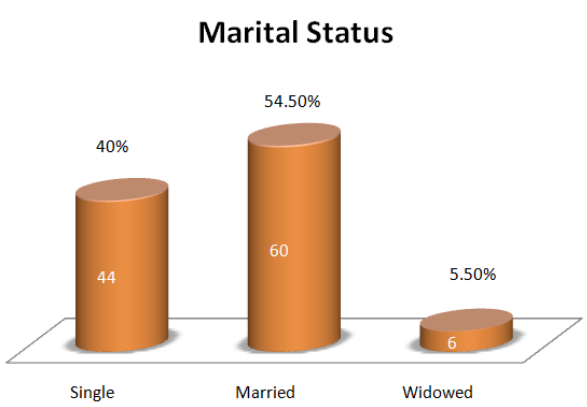

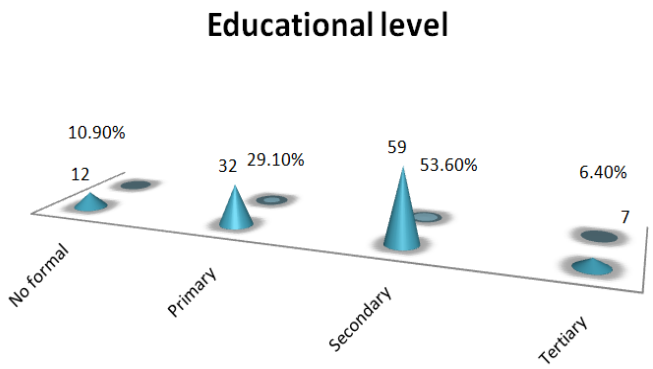

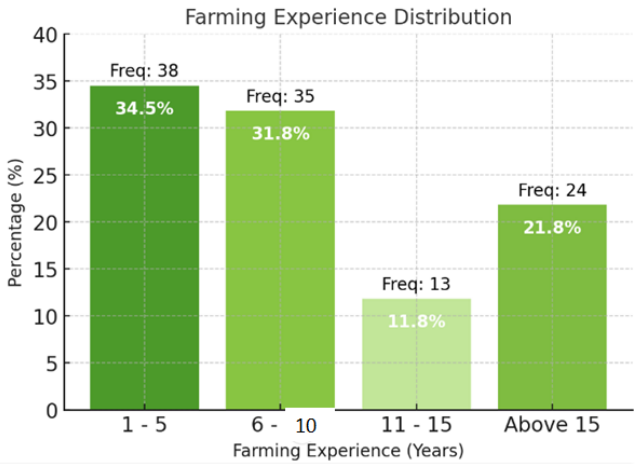

Source: Field survey, 2024

2. Constraints faced by rural farmers in implementing recommended extension strategies.

Table 1: Mean distribution of respondents based on Constraints faced by rural farmers in implementing recommended extension strategies

Constraints faced by rural farmers	SD	A	DA	SD	Mean	Rank
Limited access to ICTs, such as mobile phones and the internet etc.	1	17	66	26	1.94	10
lack access to credit and financial services	11	42	33	24	2.36	2
lack the knowledge and skills needed to effectively implement recommended extension strategies	1	26	65	18	2.09	8
limited access to inputs such as seeds and fertilizers, as well as to markets	6	31	58	15	2.25	5
lack of coordination and support among stakeholders, including government agencies, NGOs, and private sector actors	4	26	62	18	2.14	7
Lack of access to information	10	39	44	17	2.38	1
Traditional Farming practices and mindsets	7	31	53	19	2.24	6
Climate and environmental factors	7	35	48	20	2.26	4
Lack of supportive policies and institutions	10	28	57	15	2.30	3
Limited access to training and extension services	-	34	51	25	2.08	9

Source: Field survey, 2024

Discussion

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The findings from the charts on the respondents' socio-economic characteristics revealed that the majority (54.5%) of the respondents were female, while 45.5% were male. A significant portion (42.7%) of respondents were in the age group of 31-40 years, followed by 28.2%, 22.7%, and 6.4% in the age categories of 20-30, above 40, and below 20 years, respectively. In terms of marital status, most respondents (54.5%) were married, 40.0% were single, and only 5.5% were widowed. Regarding educational attainment, a majority (53.6%) had secondary education, 29.1% had primary education, 10.9% had no formal education, and 6.4% had tertiary education. In terms of household size, most respondents (49.1%) had between 1-5 members, 48.2% had 6-10 members, and 2.7% had households with more than 10 members. In terms of farming experience, 34.5% of the respondents had 1-5 years of experience, 31.8% had 6-10 years, 21.8% had more than 15 years, and 11.8% had 11-15 years of experience. Concerning monthly income, the majority (49.1%) earned above N20,000, while others earned N15,100-N20,000 (20.9%), below N10,000 (20.0%), and N10,100-N15,000 (10.9%). These results suggest that there are more female farmers than male farmers in the study area. Similar findings were reported by Sunday and Undiandeye (2018), who noted that many crops require significant time and attention, which female farmers are likely to provide, while males often engage in non-farming activities that supplement household income. Furthermore, most of the crop farmers were married young adults with secondary education, small family sizes, relatively few years of farming experience, and monthly incomes exceeding N20,000. Individuals in their productive years are generally more inclined to take risks and adopt new farming practices than older individuals, as suggested by Sunday and Undiandeye (2018).

Table 1 displays the mean ratings of respondents regarding the challenges rural farmers encounter when implementing recommended extension strategies. The primary constraint identified was limited access to information ($\bar{x}$ = 2.38), which ranked first. This was followed by restricted access to credit and financial services ($\bar{x}$ = 2.36) in second place, and the absence of supportive policies and institutions ($\bar{x}$ = 2.30) in third. Climate and environmental factors ($\bar{x}$ = 2.26) ranked fourth, while limited availability of essential inputs such as seeds and fertilizers, as well as market access ($\bar{x}$ = 2.25), came in fifth. Traditional farming practices and resistance to change ($\bar{x}$ = 2.24) ranked sixth, followed by weak coordination and support among stakeholders—including government agencies, NGOs, and private sector players—($\bar{x}$ = 2.14) in seventh place. A lack of necessary knowledge and skills to implement extension strategies effectively ($\bar{x}$ = 2.09) ranked eighth, while inadequate access to training and extension services ($\bar{x}$ = 2.08) ranked ninth. Lastly, limited access to information and communication technologies (ICTs) such as mobile phones and the internet ($\bar{x}$ = 1.94) was ranked tenth. The findings highlight that the primary challenge faced by farmers in the study area is inadequate access to information. Scoones et al. (2009) reported that many rural farmers struggle to obtain credit and financial services, which restricts their ability to adopt new technologies and farming practices recommended by extension services. Similarly, Birhanu et al. (2019) found that rural farmers often lack the necessary knowledge and skills to implement extension strategies effectively, particularly those involving new technologies or modern agricultural techniques. This knowledge gap can be attributed to factors such as low education levels, minimal exposure to innovative practices, and limited access to training and capacity-building opportunities.

Conclusion

The study concluded that rural farmers in Calabar South Local Government Area encounter several critical constraints in adopting recommended agricultural extension strategies, with the lack of access to information identified as the most pressing issue. Although the farmers posses relatively diverse socioeconomic characteristics, including moderate education levels and farming experience, these constraints hinder the effective adoption of innovations essential for improving productivity and livelihoods such as inadequate infrastructure, limited dissemination of extension services, and socioeconomic challenges. These constraints not only hinder the effective implementation of extension innovations but also limit farmers' productivity and their ability to transition to more sustainable agricultural practices.

Recommendations

1. Agricultural stakeholders and the government should develop gender-sensitive extension strategies to address the needs of the majority female farming population, ensuring equal access to resources, training, and support.
2. On constraints faced by rural farmers in the study area, Agricultural stakeholders including agricultural extension agencies, and government should:
    i. improve access to agricultural information through community-based communication hubs, mobile technologies, and regular engagement with farmers to bridge the knowledge gap.

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ii. facilitate access to credit and financial services by collaborating with microfinance institutions and cooperatives to offer affordable loan schemes tailored to the needs of rural farmers.
iii. advocate for supportive policies and institutional frameworks that prioritize agricultural development, including subsidies for inputs and enhanced market access.
iv. address climate and environmental challenges by promoting climate-resilient farming practices and providing training on adaptive techniques.
v. enhance access to quality inputs and markets by creating linkages between farmers, suppliers, and buyers through cooperative societies and public-private partnerships.
vi. promote a shift from traditional practices by introducing demonstration farms and success stories to encourage the adoption of innovative techniques.

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