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IMPACT OF COOPERATIVE SOCIETIES IN ADOPTION OF SUSTAINABLE FARMING PRACTICES AMONG RURAL FARMERS IN ANAMBRA STATE, NIGERIA.

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Abstract

The aim of the study was to determine the impact of cooperatives in adoption of sustainable farming practices among rural farmers in Anambra State, Nigeria. Two hypotheses were tested at 0.05 level of significance guided the study. The survey research design was used in the study. The population of the study comprised 13,834 members of cooperatives in Anambra State. The sample of the study was 388 members of cooperatives. Standardized questionnaire was used to collect primary data from the respondents. Data for the study was analysed using simple regression. Finding of the study revealed that cooperative education and training influences the adoption of sustainable farming practices among rural farmers in Anambra State. Furthermore, findings showed that cooperative credit facilities significantly influence the adoption of sustainable farming practices among rural farmers in Anambra State. The researcher concludes that cooperative societies significantly influence the adoption of sustainable farming practices among rural farmers in Anambra State, Nigeria. The researcher therefore recommends that Government at all levels should increase its support and commitment towards promoting the activities of cooperative societies.

Keywords: Cooperatives societies, Adoption, Sustainable Farming, and Rural Farmers

INTRODUCTION

Nigeria is an agrarian nation with a diverse agricultural landscape. The country is a major producer of a wide range of food crops, including maize, cassava, guinea corn, yam, beans, millet, and rice (Food and Agricultural Organization (FOA), 2024). Nigeria is also a leading global producer of commodities like palm oil, cocoa beans, and cashews (Sasu, 2023). Despite this abundance of agricultural resources, Nigeria faces persistent food shortages that have led to skyrocketing prices of staple foods. This situation indicates a state of food insecurity in the country. Food insecurity refers to the lack of reliable access to a sufficient quantity of affordable, nutritious food. In Nigeria, factors like poor land tenure systems, low irrigation farming, climate change, land degradation, high production costs, and limited financing have stifled agricultural productivity (FOA, 2024).

As a result, Nigeria has become a net importer of food, with agricultural imports exceeding exports by a significant margin. Nigeria's food demand continues to exceed domestic supply, leading to large-scale food imports that erode the country's foreign exchange reserves. According to recent data between 2023 and 2024, the Central Bank of Nigeria disbursed over $2.13 billion to Nigerians for importing food products (Aina, 2024). This represents a consistent demand for food imports despite Nigeria's status as the "food basket of Africa" (Aina, 2024). Aina further reported that the average price of imported food commodities to Nigeria rose by 34% in one year between April 2023 and April 2024.

The high food import bill is a major concern for Nigeria's economy. Factors like inadequate infrastructure, insecurity, and climate change have hindered progress in the agricultural sector and Nigeria's ability to achieve self-sufficiency in food production. In 2023, Nigeria's food inflation rate reached 40.53% in April, a 15.92% increase from the previous year (Tunji, 2024). This has led to astronomical increases in the prices of staple foods like

rice, potatoes, plantains, and chicken feet. For example, the price of Irish potatoes surged by 149.18% year-over-years (Tunji, 2024). This situation indicates a state of food insecurity in Nigeria, where the population lacks reliable access to affordable, nutritious food. Nigeria's food security is intimately related to the poor farming practices of many farmers in the country. Despite its prominence as an agricultural powerhouse, Nigeria continues to experience food shortages and high costs. Many Nigerian farmers use poor farming techniques, which contributes to this situation. Unsustainable farming methods lead to decreased agricultural productivity, as well as habitat loss, species extinction, and impairment of ecosystem services (Powers & Jetz, 2019). This has increased the call by stakeholders for adoption of sustainable farming practices for improving agricultural production in Nigeria.

Sustainable agriculture aims to generate food eternally without negatively influencing ecosystem health. Two significant challenges include biophysical (long-term influences on soil qualities and crop output) and socio-economic (farmers' capacity to get inputs and manage resources, including labour) (Candemir et al., 2021). The physical components of sustainability are somewhat known. Excessive tillage and inadequate irrigation can harm soil over time, causing erosion and salt buildup (Armstrong & Kamieniecki, 2019). Sustainable agriculture has three primary goals: environmental health, economic profitability, and social and economic equality. On the other hand, sustainable farming is an agricultural technique that seeks to fulfil society's current food and textile demands while preserving future generations' capacity to meet their own (Armstrong & Kamieniecki, 2019). It prioritises long-term production while reducing negative environmental repercussions. Armstrong and Kamieniecki (2019) stated that sustainable farming seeks to strike a balance between the need for resource conservation and the economic sustainability of agricultural enterprises. It can help reduce agriculture's environmental influence, which includes climate change, water shortages, pollution, land

degradation, and biodiversity loss. Transitioning to sustainable food systems is critical for feeding expanding populations and adjusting to changing environmental circumstances (Cl´emençon, 2021). Common sustainable farming practices include: Crop rotation to improve soil fertility and break pest cycles; polyculture (growing multiple crops together) to reduce need for pesticides and fertilizers; use of cover crops, green manures, and composting to restore soils; integrated pest management combining biological, cultural, mechanical and physical controls; efficient irrigation techniques like drip irrigation to reduce water usage; raising heritage livestock breeds and growing heirloom plant varieties adapted to local conditions (Powers & Jetz, 2019). Cooperative societies can help to promote the adoption of sustainable practices among farmers especially among rural farmers in Anambra State.

Agricultural cooperatives are vertically integrated organisations that prioritise member welfare (Soboh et al., 2012). Cooperatives operate in a wide range of agricultural industries and may thus play a role in improving farm sustainability. Agricultural cooperatives, with their intimate contacts with farmers, may be essential actors in supply chains, assisting farmers in changing their agricultural methods and encouraging the adoption of more sustainable techniques. Cooperative ideals such as democratic decision-making, equality, and solidarity distinguish cooperatives from other types of enterprises and indicate a specific organisational characteristic (ICA, 2020; Zhou et al., 2019). Cooperative solidarity helps farmers manage market risks and share fixed expenses, promoting investment. Agricultural cooperatives have a broad scope of action since its members are the cooperative's owners, investors, and users (Naziri et al., 2014; Ofori et al., 2019). Agricultural cooperatives promote sustainable development by producing, processing, selling, distributing, and financing agricultural goods (Ibitoye, 2012). Agricultural cooperatives provide inputs like fertilisers and seedlings, as well as training farmers on new methods to increase production (Nnadozie, et al., 2015). Candemir et al. (2021) stated

that agricultural cooperatives help farmers assess their requirements, improve their education, provide input services, and package and advertise their goods, among other things. Cooperatives may also encourage the adoption of these methods by lowering farmers' perceived risks and making investment more attractive (Ortega et al., 2019; Zhang et al., 2020). However, there are significant flaws in cooperative governance, particularly in monitoring and administration that might inhibit improvement (Candemir et al., 2021). These views have not been empirically proven to be the case in Anambra State. It is against this background that the study the researcher determined the influence of cooperatives in adoption of sustainable farming practices among rural farmers in Anambra State.

Aims and Objectives

The main aim of the study was to determine the impact of cooperatives in adoption of sustainable farming practices among rural farmers in Anambra State. Specifically, the study:

1. Ascertain the impact of cooperative education and training on the adoption of sustainable farming practices among rural farmers in Anambra State.
2. Examine the impact of cooperative credit facilities on the adoption of sustainable farming practices among rural farmers in Anambra State.

Hypotheses

The null hypotheses were tested at 0.05 level of significance:

1. Cooperative education and training does not significantly influence the adoption of sustainable farming practices among rural farmers in Anambra State.
2. Cooperative credit facilities does not significantly influence the adoption of sustainable farming practices among rural farmers in Anambra State.

Methodology

Research Design

The study adopted the survey research design. This design is appropriate because it will not be feasible to study the entire population; instead, a set of items will be studied by gathering and analysing data from a small number of participants who are thought to be representative of the entire group.

Area of the Study

The study was conducted in Anambra State, located in the southeastern part of Nigeria. Anambra State, established in 2011 from the old Anambra State, has Awka as its capital and seat of government, while Onitsha and Nnewi are its largest and most industrial cities. The state is known by its theme, "Light of the Nation." Anambra State is bordered by Delta State to the west, Imo State and Rivers State to the south, Enugu State to the east, and Kogi State to the north. The state comprises twenty-three local government areas and three senatorial zones: Anambra Central, Anambra South, and Anambra North. It is rich in natural resources such as natural gas, crude oil, bauxite, and ceramic, and has almost entirely arable soil. The state is predominantly inhabited by the Igbo ethnic group, who are traditionally farmers, fishermen, craftsmen, and traders. The main crops grown by farmers in the state include yam, palm produce, rice, cassava, cocoyam, vegetables, and various fruit trees. Fishing is a common activity, especially among those living in the riverside areas. Anambra State has a fertile landscape with undulating terrain, tall trees, and lush vegetation that remains green throughout the year. The state experiences two major seasons: the rainy season, which begins at the end of March and lasts until the end of October, and the dry season, which starts in November and ends in March. With an annual rainfall of about 3,000mm, Anambra State is highly suitable for agricultural production.

Population of the Study

Members of agricultural cooperatives in Anambra State make up the population of the study. The twenty-one local government areas of Anambra State spread across the four agricultural zones, which are Anambra, Onitsha, Awka, and Aguata. With 17,436 members, the state is home to 3,486 recognised cooperative societies, 2,856 of which are agricultural cooperatives with 13,484 members. The population of the study consisted of 870 registered agricultural cooperatives from the chosen zones. (Source: Ministry of Trade, Commerce, Market, and Wealth Creation, Anambra State, Department of Cooperatives, 2024).

Sample Size Determination

To determine the sample size for the study, Taro Yamane's formula for a finite population was used. The formula is given as:

$n=N/(1+N(e)^2$

Where:

Where

n = sample size

N= Population of the study

E= Sampling error (in this case 5 percent)

The sample size is therefore computed as follows:

From the above, $n= 13484/1+13484(0.05)^2$

n=388

Sample Technique

A multi-stage sampling technique was employed to determine the actual sample for the study, carried out in four stages. In the first stage, two agricultural zones (Anambra zone and Aguata zone) were randomly selected from the four agricultural zones (Anambra zone,

Onitsha zone, Awka zone, and Aguata zone) using a simple random sampling technique. In the second stage, judgmental sampling was used to select four Local Government Areas (Ayamelum LGA, Orumba South LGA, Anambra West LGA, and Oyi LGA) as advised by Development Officers at the Ministry of Agriculture, as these areas are considered the food basket of Anambra State. In the third stage, simple random sampling was used to select three towns from each of the four selected Local Government Areas, resulting in a total of twelve (12) towns. In the fourth stage, simple random sampling was again used to select two cooperative societies from each of the twelve towns, resulting in a total of twenty-four (24) cooperative societies.

Instrument for Data Collection

Standardized questionnaire was used to collect primary data from the respondents.

Validity of the instrument

Regardless of how exact and meticulous the researcher is, nearly all measuring equipment have some degree of inaccuracy. Therefore, efforts have to be focused on guaranteeing a comparatively elevated degree of validation for the research tool. As a consequence, three experts in the Department of Cooperative Economics and Management assessed the questionnaire and made adjustments to items in the instrument.

Reliability of the instrument

Using a pilot test in the Enugu State, the instrument's reliability was assessed using the Cronbach Alpha technique. A reliability co-efficient value of 0.884 was observed, therefore verifying its reliability.

Data Analysis

Socioeconomic characteristics, descriptive statistics were calculated in the form of tables, frequencies, and percentages. A simple regression and multiple regression analysis were used to analyse the collected data.

Results

Bio-data of Respondents

The respondents' socio-economic details (bio-data) were arranged based on their marital status, gender, age distribution, educational background, years of cooperative experience, type of farming.

Table 1: Distribution According to the Bio data of Respondents

Variable	Frequency	Percent (%)	Cumulative (%)
Gender			
Male	289	74	7.6
Female	99	26	12.2
Total	388	100.0	
Age (Years)			
Less than 20	23	5.9	17.2
21-30	84	21	40.2
31-40	187	48	81.2
41- 50	64	16	10.4
51 -60	23	5	
61 and above	07	1.8	100
Total	388	100	

Educational Qualification			
Not Educated	36	9.27	40.6
Primary	186	47.9	24. 5
Secondary	103	26.5	82.4
Tertiary	63	16.2	100
Total	388	100.0	
Years of Cooperative Experience			
1-5	176	45.3	25.0
6 – 10	171	44.0	64.8
11 – 15	31	7.9	91.5
15 – 30	10	2. 5	100
Total	388	100	
Marital Status			
Married	136	35.0	68.5
Single	153	39.4	100.0
Widow/ widower	93	23.9	38.6
Total	388	100.0	
Type of Farming			
Arable (Crop) Farming	176	45.3	34.2
Pastoral (Livestock) Farming	196	50. 5	26.0
Mixed (Crop & Livestock farming)	16	4.12	81.2
Total	388	100.0	

Source: Field Survey, 2024

As shown in Table 1, 74% of the respondents are males, while 26% are females, indicating that the majority of farmers in the state are male. The age distribution of the respondents is as follows: less than 20 years (5.9%), 21-30 years (84%), 31-40 years (48%), 41-50 years (16%), 51-60 years (5%), and 61 years and above (1.8%). This indicates that most of the farmers are mature adults. Regarding educational qualifications, 9.27% of the respondents are not educated, 47.9% have a primary education, 26.5% have a secondary education, and 16.2% have a tertiary education. This means that a significant percentage of the farmers have basic educational knowledge. The respondents' years of cooperative experience range from 1-5 years (45.3%), 6-10 years (44%), 11-15 years (7.9%), and more than 15 years (2.5%). This shows that most of the farmers have considerable experience as cooperative members. In terms of marital status, 35% of the respondents are married, 39.4% are single, and 23.9% are widowed. The types of farming businesses among the respondents are arable farming (45.3%), livestock farming (50.5%), and mixed farming (4.12%). This indicates that most respondents are engaged in livestock farming.

Hypothesis 1

Cooperative education and training does not significantly influence the adoption of sustainable farming practices among rural farmers in Anambra State.

Table 2: Summary of simple regression analysis on influence of Cooperative education and training does on the adoption of sustainable farming practices among rural farmers in Anambra State

		Unstandardized β	Std. Dev. β	Standardized β	t-value	p-value
Constant		28.156	4.367		28.452	.000
Cooperative education and training		.638	.411	.612	31.291	.000
R	.612					
R^2	.608					
Adj. R^2	.601					
F	42.642					.000

The summary of the test of significance of simple regression analysis as shown in Table 7 revealed that the simple regression coefficient (R) is .612 while the R^2 is .608 and Adjust R^2 is .601. The F-ratio associated with regression is 42.642, the t-test is 31.291 and the P-value = .000. Since p-value (.000) is less than the specified level of significance .05, the study therefore rejected the null hypothesis that cooperative education and training does not influence the adoption of sustainable farming practices among rural farmers in Anambra State and accepted the alternative hypothesis that cooperative education and training influences the adoption of sustainable farming practices among rural farmers in Anambra State. The finding of the study is in agreement with the report of Candemir et al. (2021) who revealed that agricultural cooperatives help farmers assess their requirements, improve their education, provide input services, and package and advertise their goods, among other things. Naziri et al. (2014) revealed that through education and training

offered to its members, cooperatives help its members to adopt sustainable agricultural practices.

Hypothesis 2

Cooperative credit facilities do not significantly influence the adoption of sustainable farming practices among rural farmers in Anambra State.

Table 3: Summary of simple regression analysis on influence of cooperative credit facilities does on the adoption of sustainable farming practices among rural farmers in Anambra State

		Unstandardized β	**Std. Dev. β**	**Standardized β**	**t-value**	**p-value**
Constant		34.281	5.972		21.094	.000
Cooperative Credit Facilities		.678	.349	.651	29.185	.000
R	.651					
R^2	.627					
Adj. R^2	.613					
F	33.459					.000

The summary of the test of significance of simple regression analysis as shown in Table 3 revealed that the simple regression coefficient (R) is .651 while the R^2 is .627 and Adjust R^2 is .613. The F-ratio associated with regression is 33.459, the t-test is 29.185 and the P-value = .000. Since p-value (.000) is less than the specified level of significance .05, the study therefore rejected the null hypothesis that cooperative credit facilities do not significantly influence the adoption of sustainable farming practices among rural farmers in Anambra State and accepted the alternative hypothesis that cooperative credit facilities significantly influence the adoption of sustainable farming practices among rural farmers

in Anambra State. This finding is in agreement with Zhang et al. (2020) who revealed that cooperatives offer members access to credit facilities that allows them to undertake innovative practices for farm improvement. Ibitoye (2012) stated that cooperatives offer members assist their members in terms of financing projects or providing access to credit for sustainable development practices. In agreement, Zhou et al. (2019) reported that cooperative societies pool resources together to provide access to credit to members for carrying out sustainable practices.

Conclusion

The researcher concludes that cooperative societies have significant influence in the adoption of sustainable farming practices among rural farmers in Anambra State. Cooperative through their roles of providing cooperative education and training as well as provision of credit facilities could assist rural farmers in adopting sustainable farming practices. It is therefore pertinent for actions to be taken by stakeholders in promoting the activities of cooperative societies in rural communities so as to achieve sustainable development in Anambra State in particular and Nigeria in general.

Recommendations

The following recommendations were proffered as a result of the findings of the study:

1. Government should increase its support and commitment towards promoting the activities of cooperatives. This can be done by providing finance and expertise for the organization of workshops, seminars, conferences and other forms of interactions that would promote education and training for the adoption of sustainable practices among rural farmers.
2. Management of cooperative societies should collaborate with commercial and micro-finance banks so as to improve the availability and accessibility of credit facilities for rural farmers. Cooperative societies should work with financial

institutions to offer low-interest loans and grants that can support the adoption of sustainable farming methods.

3. Government in collaboration with management of cooperative societies should carry out awareness campaigns aimed at encouraging more farmers to join cooperative societies by highlighting the benefits of membership, such as access to resources, training, and financial support.

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