Assessment of Agricultural Cooperative Societies on Farm Input Supply in Ekiti State, Nigeria

ABSTRACT

This research investigated how agricultural cooperative societies in Ekiti State, Nigeria, influenced the supply of farm inputs. The results indicate that most cooperative society members were male, in their working-age years, and had received formal education. These individuals were typically engaged in farming or held civil service jobs and accessed various benefits like employment opportunities, credit, dividends, agricultural inputs, and access to the output market through their cooperative society. The study revealed that 71.1% of farmers belonged to a cooperative society, with 51.1% having a membership duration of 1-5 years. The largest portion of farmers inherited their land (35.6%). Cooperative societies typically consisted of 6 to 10 members, and a substantial 60% of farmers had received formal education. Moreover, 64.4% had access to the output market through their cooperative society. Overall, the research demonstrates that agricultural cooperative societies in Ekiti State play a significant role in enhancing the supply of farm inputs, offering crucial resources and assistance to local farmers.

Keywords: Agricultural cooperative, farm input, Probit regression

Introduction

It is a historical fact that agriculture has traditionally served as the primary means of sustenance for people, particularly in rural areas where a significant proportion of the world's impoverished and hungry population resides. In post-independent Nigeria, agriculture played a crucial role, contributing approximately 80 percent to the Gross Domestic Product (GDP). However, this prominence diminished after the discovery of oil in 1958, leading to its boom in the 1970s (Nlebem & Raji, 2019). Despite numerous programs initiated to address this decline, they often fell short of their intended objectives (Toluwase & Apata, 2013). To revive agricultural sustainability, initiatives such as agricultural cooperative banks and development programs were introduced.

Empirical evidence has extensively documented the positive role of agricultural cooperatives in fostering the adoption of improved agricultural technologies, enhancing economic performance, and improving the welfare of smallholder farmers (Abebaw and Haile, 2013; Ainembabazi *et al.*, 2017; Wossen *et al.*, 2017). For example, studies in rural Nigeria demonstrated the favorable impact of cooperative societies on the adoption of improved agricultural technology and household welfare (Wossen *et al.*, 2017). Similarly, research indicated that farmers affiliated with producer organizations exhibited higher value-added, profitability, labor productivity, and employment compared to non-members (Michalek *et al.*, 2018).

Since the proliferation of cooperatives in Nigeria, various types have emerged, including consumers' cooperative societies, producers' cooperative societies, farmers' cooperative societies,

marketing cooperative societies, and thrift cooperative societies. Agricultural cooperatives provide a platform for smallholder farmers to access essential resources such as land, water, seeds, information on modern extension practices and machinery, adequate finance, efficient marketing skills, and an established marketing structure.

Despite increasing recognition of the vital role of agricultural cooperatives, only a few empirical studies have explored the relationship between cooperative membership and its impact on farm input supply and yield for smallholder farmers. The existing studies present mixed results, with some indicating a positive impact while others report insignificance. Differences in cooperative structures, operations, and estimation techniques may account for this variation, highlighting the need for further examination.

As consumer sensibilities and farmer initiatives drive the demand for more sustainable farm inputs, the supply chain organization's role in achieving environmental and social sustainability has been underexplored. This study contributes to the literature by assessing the impact of agricultural cooperative membership on farm input supply in Ekiti State, Nigeria. Recognizing that farmers' decisions to join cooperatives are non-random and influenced by both observed and unobserved factors, this research aims to correct for sample selection bias. By analyzing comprehensive survey data spanning Nigeria's six geopolitical zones, the study seeks to identify farm managerial, socioeconomic, and plot-specific factors affecting farmers' decisions to participate in agricultural cooperatives. The ultimate goal is to inform effective policies addressing the constraints and incentives associated with farmers' participation in cooperatives in rural Nigeria, sub-Saharan Africa, and globally.

METHODOLOGY

The study area: This research was carried out in Ekiti State, which is situated in the Southwestern region of Nigeria. Ekiti State, positioned in the tropical zone, was established on the 1st of October, 1996, and comprises 16 Local Government Areas (LGAs). It covers an approximate land area of 6,602.8 square kilometers and had a population of 2,432,321 according to the National Population Census of 2006. Ekiti State is primarily an agricultural region, with key cash crops including cocoa, timber, oil-palm, and kolanuts. Food crops like cassava, yam, cocoyam, as well as grain crops such as maize and rice are also cultivated. In this area, men are predominantly engaged in farming, while women are primarily involved in trading activities. Even among the educated local residents employed in the formal sector, farming serves as a secondary occupation (Owoeye *et al*., 2023).

The State experiences two distinct seasons: the rainy season and the dry season. As of the 2006 National Population Census, Ekiti State had a population of 3,423,535. The region is mainly agrarian, with agriculture serving as the primary source of livelihood. Tree crops, including cocoa, mango, cashew, citrus, oil palm, and arable crops such as maize, yam, cassava, cocoyam, tomatoes, and various vegetables, are cultivated in the area.

Sampling procedure and sample size determination: This research randomly selected farmers' cooperative societies located in Ado-Ekiti LGA based on their accessibility and manageability.

List 1 : List of the Co-operative Societies

Town	Names of the Co-operative Societies	Membership Size
Ado Ekiti	National Agricultural Production Cooperative Union of Nigeria Limited	32
	Springboard Farmers Multi-Purpose Cooperative Limited	22
	Green Seed Fadama Cassava Processing Cooperative Multipurpose Society	19
	Lands And Housing Cooperative Multipurpose Society Limited	16
	All Farmers Association of Nigeria (AFAN) Ekiti State Chapter	12
	Agbewumi Farmers' Cooperative Multipurpose Society Limited	10
	Ado Ekiti Igimokogo Ateco Fadama Farmers' Cooperative Multipurpose Society	6

Taro Yamane's formular will be used to determine the sample size.

Formular: - $n = {}^{N}/_{1+N(e)^2}$

In the formular above;

n = the required sample size from the population under study

N = the whole population that is under study

e = the precision or sampling error

where: - N = 117

e = 0.05

$n = {}^{117}/_{1+117(0.05)^2}$

$= \underline{90}$

Therefore, a sample size of 90 respondents would therefore be the lowest acceptable number of responses to maintain a 95% confidence level.

DATA COLLECTION

Primary Data: - Structured questionnaire was the major source of primary data collection. The questionnaire was designed in line with the objectives of the study and the research employed the use of multiple-choice questions and Likert-type scale procedure with five levels.

DATA ANALYSIS

Descriptive statistics such as mean, percentage, frequency distribution and scale analysis was used to analyze the socio-economic characteristics of the respondents and the constraints encountered by cooperative societies while, probit regression was used to analyze the factors determining participation of farmers in cooperative societies.

Y is the dependent variable while X is the independent variable

$Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \ldots + \beta_9 X_9 + e$

Where;

Y = Participation of farmers in Agricultural cooperative society (Yes = 1), (No = 0)

X_n = Factors determining farmers participation in agricultural cooperative societies

X_1 = Age (years)

X_2 = Sex (Male = 1, female = 0)

X_3 = Marital status (Single = 1, married = 2, separated = 3, widowed = 4)

X_4 = Educational level (no formal education = 1, primary education = 2, secondary education =3, tertiary education = 4)

X_5 = Primary occupation (Farming = 1, civil service = 2, trading = 3, artisanal job = 4)

X_6 = Mode of Land Acquisition (Inheritance =1, rent = 2, lease =3, purchase = 4)

X_7 = Status in Cooperative (Executive = 1, ordinary member = 2)

X_8 = Access to Credit (Yes = 1, otherwise = 0)

X_9 = Periodic Dividends (Yes = 1, otherwise = 0)

RESULTS

The table 1 displays data regarding the distribution of respondents based on their methods of acquiring farmland. The information is presented in terms of both frequency and percentage. It offers insights into the various means through which individuals obtain farmland. The majority of respondents inherited their farmland, while a notable proportion purchased or leased their farmland. Among the 90 respondents, 71.1% are members of a cooperative society. Additionally, 17.8% hold executive positions within these societies, while only 3.3% serve as chairmen. The remaining 7.8% are categorized as "Other Specify," suggesting alternative roles or statuses within the cooperative society. This table provides an overview of the composition of respondents' roles within their respective cooperative societies, underscoring the significance of member involvement in cooperative decision-making processes.

Furthermore, the table presents data concerning the duration of respondents' participation in their cooperative societies, categorized into three groups: 1-5 years, 6-10 years, and 11 years and above. This information sheds light on the length of time members have been engaged in the cooperative society, offering insights into the cooperative's dynamics and its members. It suggests that the majority of members are relatively new to the cooperative, while a smaller group has maintained longer-term involvement, possibly indicating a more committed and loyal membership base.

The table also reveals that out of the total 90 respondents, 58 individuals (64.4%) have access to employment through their cooperative society, while 32 individuals (35.6%) do not have such access. Similarly, 58.9% of the respondents have access to credit through the cooperative society, while 41.1% do not. This information highlights the level of access to credit and employment through cooperative societies among the respondents, indicating that a significant portion has access to these services.

Additionally, the table illustrates the distribution of respondents in terms of access to agricultural inputs through cooperative societies. It shows that out of the 90 respondents, 63.3% have access to agricultural inputs through cooperative societies, while 36.7% do not. This suggests that a substantial proportion of respondents benefit from access to agricultural inputs through cooperative societies.Regarding access to output markets through cooperative societies, the table demonstrates that 64.4% of the respondents have access, while 35.6% do not. It provides an overview of the level of access to output markets facilitated by cooperative societies among the surveyed population.

The table categorizes the respondents into three levels: Primary/Rural, Secondary/Urban, and Tertiary/Apex, based on their cooperative society membership. Among these, 41.1% belong to the Primary/Rural level, 46.7% to the Secondary/Urban level, and 12.2% to the Tertiary/Apex level. It also presents the percentage of respondents in each category who have access to the output market. The data reveals that a higher proportion of respondents at the Secondary/Urban level have access to the output market compared to the other two levels.Furthermore, the table categorizes the respondents based on the size of their cooperative society membership. It identifies four groups: 1-5 members, 6-10 members, more than 10 members, and "Others." The majority of cooperative societies surveyed fall into the 6-10 members and more than 10 members categories.

Additionally, the table showcases the distribution of respondents according to the number of years their cooperative society has been in existence. The three categories are 1-5 years, 6-10 years, and above 10 years. It indicates that more than half of the respondents belong to cooperative societies that have been established for six to ten years.The table also presents data on government assistance to cooperative societies. Among the 90 respondents, 60% reported receiving government assistance, while 40% did not. This data can serve as a basis for further

analysis to understand the nature and impact of government support on cooperative society operations.

Finally, the table provides insight into the various sources of funds for cooperative societies. The respondents indicated the percentage of their cooperative society's funds sourced from donations, share capital, thrift savings, reserve, levies, fines, loans, overdrafts, and retained earnings. The majority of respondents cited retained earnings as a significant source of funds.

Distribution of the Respondents by the mode of Acquiring Farmland

Table 1. Socio-Economic Characteristics of the Respondents

Variables	Categories	Frequency	Percentage
Mode of acquiring land	Inheritance	32	35.6
	Purchased	26	28.9
	Rented	9	10.0
	Leased	23	25.6
Status in their cooperative society	Member	64	71.1
	Executive	16	17.8
	Chairman	3	3.3
	Other Specify	7	7.8
Period of Participation	1-5 years	46	51.1
	6-10 years	32	35.6
	11 years and above	12	13.3
Access to employment	Yes	58	64.4
	No	32	35.6
Access to credit	Yes	53	58.9
	No	37	41.1
Periodic dividends	Yes	57	63.3
	No	33	36.7
Access to agricultural input	Yes	57	63.3
	No	33	36.7
Access to output market	Yes	58	64.4
	No	32	35.6
Level of Operation	Primary/Rural	37	41.1
	Secondary/Urban	42	46.7
	Tertiary/Apex	11	12.2

Years of existence	1-5 years	24	26.7
	6-10 years	49	54.4
	Above 10 years	17	18.9
Assistance from government	Yes	54	60.0
	No	36	40.0
Source of funds	Donations	7	7.8
	Share Capital	6	6.7
	Thrift Savings	5	5.6
	Reserve	4	4.4
	Levies and Fines	6	6.7
	Loans and Overdraft	7	7.8
	Retained earnings	25	27.8
	All of the above	24	26.7
	Any of the above	5	5.6
	Other	1	1.1
Types of cooperative society	Crop production	14	15.6
	Agro processing	30	33.3
	Fish farming	29	32.3
	Livestock farming	15	16.7
	Procurement of farm input for members	2	2.2

Source: field survey, 2023

The table 2 provides a statistical analysis of the variables determining involvement in a cooperative society. These variables encompass age, gender, marital status, education, occupation, land acquisition method, cooperative society status, membership size, access to employment, access to credit, and the duration of participation as independent factors. The findings reveal that education, occupation, and land ownership method are influential factors determining participation in the cooperative society. Higher education and specific occupations are associated with positive coefficients, indicating a greater likelihood of participation. Similarly, owning one's land is also associated with a positive coefficient, implying a higher likelihood of involvement. Sex and membership size show marginal significance, whereas the remaining variables do not exhibit statistical significance. To enhance its effectiveness, the cooperative society can target its outreach and services towards members with higher education and specific occupations while also facilitating land ownership for its members.

Table 2: Factors Determining Participation of Members in Cooperative Society

Variable	Coefficient	Standard Error	P>|z|
Constant	-1.4103	1.323	0.287
Age	0.2814	0.3311	0.395

Sex	0.2780*	0.1600	0.082
Marital Status	-0.0781	0.1654	0.637
Education	0.8682***	0 .3070	0.004
Occupation	0.2258**	0.0323	0.001
Mode of land acquisition	0.2318*	0.1264	0.067
Status in Cooperative Society	0.0833	0.1669	0.618
Membership size of Cooperative Society	-0.3367*	0.2002	0.091
Access to Employment	-0.0468	0.3037	0.877
Access to Credit	0.3118	0.2877	0.278
Period of participation in Cooperative Society	0.2124	0.3039	0.485

The table displays the challenges faced by a cooperative society, detailing nine distinct types of constraints and their respective frequencies and percentages. These constraints encompass issues such as inadequate official management, insufficient or absent training, a lack of cooperative education, members' insufficient commitment, limited marketing opportunities, subpar storage facilities, insufficient capital, and other miscellaneous concerns.In the frequency column, you can see how frequently each constraint was mentioned, while the percentage column illustrates the proportion of the total constraints represented by each specific issue. For instance, "poor management by officials" was mentioned nine times, constituting 10% of the total constraints encountered.

This table offers valuable insights for cooperative societies aiming to enhance their operations. By identifying the prevalent constraints, these societies can prioritize efforts to address the most significant challenges that impede their progress. For example, the table underscores that a lack of members' commitment was the most frequently cited constraint, making up 21.1% of the total constraints observed. Consequently, cooperative societies may consider strategies to boost member engagement and commitment to tackle this issue effectively. Similarly, addressing concerns related to inadequate training, poor management, and insufficient capital could contribute to improving the overall performance of these cooperative societies.

List 2 : Constraints Encountered by Cooperative Society

Constraint Encountered	Frequency	Percent
Poor management by officials	9	10.0

Lack/inadequate training	16	17.8
Lack of cooperative education	13	14.4
Lack of members' commitment	19	21.1
Inadequate marketing outlets	16	17.8
Poor storage facilities	6	6.7
Inadequate capital	6	6.7
others	5	5.6
Total	90	100.0

Conclusion

In conclusion, the study highlights the significant role that agricultural cooperative societies play in improving the availability and accessibility of farm inputs for smallholder farmers in Ekiti State, Nigeria. The results showed that there is a positive and significant relationship between the involvement of farmers in agricultural cooperative societies and their access to farm inputs such as seed, fertilizer, and pesticides. Moreover, the findings indicate that cooperative societies play a crucial role in improving the livelihoods of farmers by providing them with improved access to agricultural inputs, which in turn increases their crop yields and overall income.

Recommendations

In order to further strengthen the positive impact of agricultural cooperative societies on farm inputs supply, it is recommended that the following actions be taken:

1. Increase government support: The government should increase its support for agricultural cooperative societies by providing them with financial and technical assistance, as well as favorable policies and regulations that encourage their growth and sustainability.
2. Strengthen linkages between cooperative societies and input suppliers: The cooperative societies should establish stronger linkages with input suppliers, both locally and internationally, in order to ensure a constant and reliable supply of quality farm inputs.
3. Enhance the capacity of cooperative societies: The capacity of cooperative societies should be enhanced through training and capacity building programs that focus on effective management, marketing, and financial management.
4. Encourage farmer participation: The cooperative societies should actively engage and involve farmers in decision-making processes, such as setting the prices of inputs, in order to increase their trust and participation in the society.

5. Promote technology adoption: The cooperative societies should encourage the adoption of new technologies and innovations in agriculture, such as precision agriculture, which can help farmers improve their productivity and efficiency.

Finally, it is also important that farmers be properly educated and sensitized on the benefits and importance of being members of cooperative societies. With these recommendations in place, it is believed that agricultural cooperative societies will continue to play a crucial role in improving the supply of farm inputs to farmers in Ekiti State, Nigeria and ultimately, contribute to the overall development of the agriculture sector.

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