

Journal of Rural and Community Development

Agricultural Cooperatives And Food Sovereignty: A Case Study In Oyo State, Western Nigeria

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Citation:

Robles, W., & Akintola, O. B. (2025). Agricultural cooperatives and food sovereignty: A case study in Oyo State, Western Nigeria. *The Journal of Rural and Community Development*, 20(3), 179–205.

Publisher:

Rural Development Institute, Brandon University.

Editor:

Dr. Doug Ramsey

Open Access Policy:

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Agricultural Cooperatives and Food Sovereignty: A Case Study in Oyo State, Western Nigeria

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Abstract

Based on interview surveys, this study examines the performance of small-scale agricultural cooperatives in the Ibarapa North, Ibarapa East, and Ibarapa Central local government areas of Oyo State, Western Nigeria. The farmers in Oyo State are predominantly small-scale producers and most of them are involved in one form or another in agricultural cooperatives. Empirical studies have consistently demonstrated that Nigeria is facing a severe food crisis due to growing population and insufficient local food production due to reliance on food import. The Nigerian government has promoted programs to increase domestic food production, and agricultural cooperatives have played an important role in this process. This study demonstrates that government efforts to reduce food insecurity through the agricultural cooperative sector has not produced the expected results. The cooperatives are at a risk of further marginalization due to poorly designed and implemented government-sponsored support programs. The cooperatives are being crippled by insecure land tenure, constrained agricultural credits, limited access to markets and farm inputs, technological, and inadequate technological resources. This study concludes that to be effective, the Nigerian government needs to fundamentally revise its agricultural cooperative programs by giving cooperative stakeholders more access to productive resources.

Keywords: Nigeria; agriculture cooperatives; family farmers; food insecurity

Coopératives agricoles et souveraineté alimentaire : une étude de cas dans l'État d'Oyo, à l'ouest du Nigéria

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Résumé

Basée sur des entretiens, cette étude examine la performance des coopératives agricoles de petite taille dans les collectivités locales d'Ibarapa Nord, d'Ibarapa Est et d'Ibarapa Centre, dans l'État d'Oyo, à l'ouest du Nigéria. Les agriculteurs de l'État d'Oyo sont majoritairement de petits producteurs et la plupart d'entre eux sont impliqués, d'une manière ou d'une autre, dans des coopératives agricoles. Des études empiriques ont systématiquement démontré que le Nigéria est confronté à une grave crise alimentaire en raison de la croissance démographique et d'une production alimentaire locale insuffisante qui dépend des importations alimentaires. Le gouvernement nigérian a promu des programmes visant à accroître la production alimentaire nationale, et les coopératives agricoles ont joué un rôle important dans ce processus. Cette étude démontre que les efforts du gouvernement pour réduire l'insécurité alimentaire par le biais du secteur coopératif agricole n'ont pas produit les résultats escomptés. Les coopératives risquent d'être davantage marginalisées en raison de programmes de soutien gouvernementaux mal conçus et mal mis en œuvre. Les coopératives sont paralysées par l'insécurité foncière, les contraintes de crédit agricole, l'accès limité aux marchés et aux intrants agricoles, ainsi que par l'insuffisance des ressources technologiques. Cette étude conclut que pour être efficace, le gouvernement nigérian doit revoir en profondeur ses programmes de coopératives agricoles en donnant aux acteurs concernés un meilleur accès aux ressources productives.

Mots-clés : Nigéria ; coopératives agricoles ; agriculteurs familiaux ; insécurité alimentaire

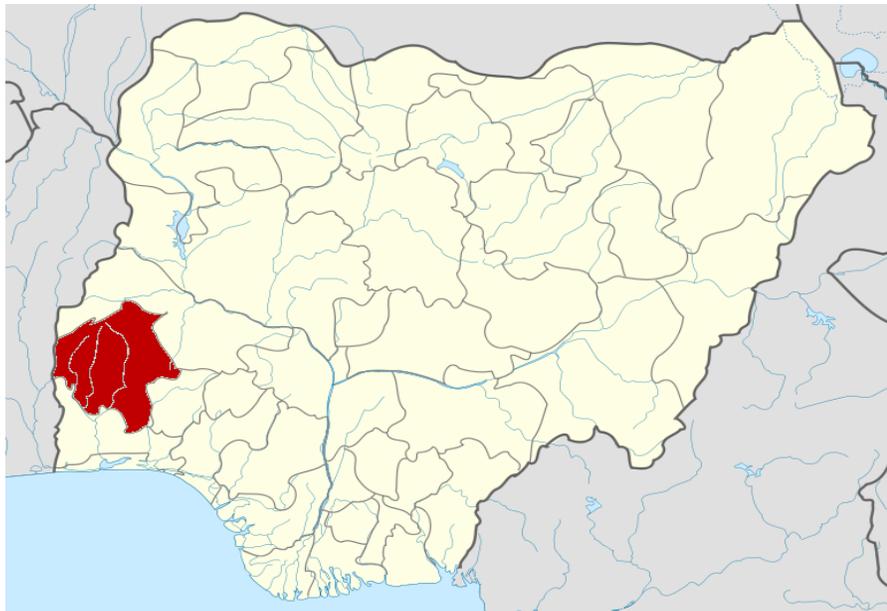
1.0 Introduction

This quantitative study examines the performance of small-scale agricultural cooperatives in the Ibarapa North, Ibarapa East, and Ibarapa Central local governments areas of Oyo State, Western Nigeria. The study employs a food sovereignty theoretical perspective supported by data collected through on-site interview surveys. This theoretical and methodological research approach is appropriate to examine the strengths and weaknesses of agricultural cooperatives in Western Nigeria, where most small-scale farmers are involved in cooperatives. The Nigerian government has promoted programs to increase food production, and agricultural cooperatives have played an important role in this process. The study demonstrates that government efforts to reduce food insecurity has not produced the expected results due to a combination of factors that have severely hindered the productive efficiency of the cooperatives.

1.1 The Importance of This Research Study

This study was conducted in Oyo State, Nigeria (see Figure 1 and Figure 2). Oyo State is made up of 33 local government areas with a population of over 7.8 million people (Nigeria Bureau of Statistics, 2023). Agriculture is the main occupation of the people of Oyo State with about 70% of the inhabitants engaging in small-scale farming. Most of these small-scale farmers are involved in some form of agricultural cooperative. (Akinwalere & Uche, 2019). There is a need to increase food production in Nigeria to meet local demands, reduce the rate of food imports, and diversify the economy from crude petroleum dependency. Agricultural cooperatives must play an important role in this process. Therefore, it is critically relevant to have empirically based studies that examine the challenges and opportunities that agricultural cooperatives face in their fundamental tasks of increasing food production and revitalizing rural economies.

Figure 1: Map of Nigeria showing where Oyo State is located.



Source: Wikipedia, 2025.

Figure 2: Map of Oyo State local government areas.



Source: Nigeria Muse, 2010.

2.0 Background of the Study

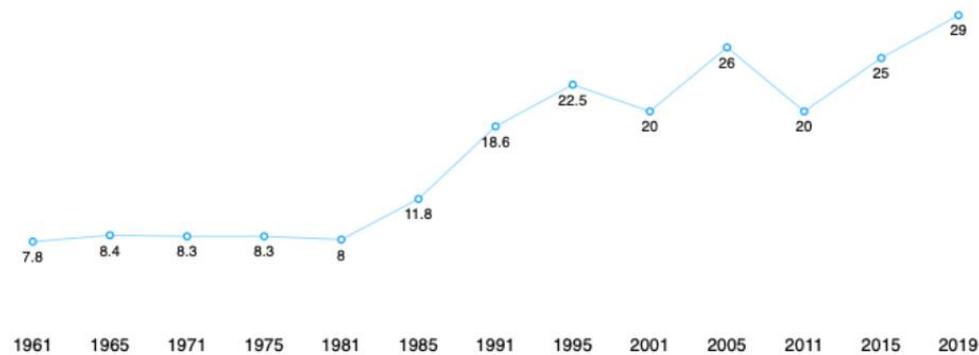
2.1 The Role of Agriculture in the Nigerian Economy

Nigeria is the largest economy in Africa with a GDP of US\$512 billion with a combined urban and rural population of almost 211 million people (World Development Indicators, 2022). It is also a multi-ethnic and culturally diverse country with great economic potential due to its abundant human and natural resources. Since the 1970s, Nigeria has been Africa's main oil exporter and has the largest untapped natural gas reserves on the African continent. Agriculture plays an important role in the Nigerian economy by employing two-thirds of the entire labour force (FAO, 2021). Small-scale farmers are the backbone of Nigerian agriculture. More than 80% of the total farmers are small-scale farmers, who contribute significantly to Nigeria's food production (FAO, 2021). Over the last two decades, however, food crop production has not kept pace with population growth, primarily due to poorly designed, implemented, and managed government agricultural policies and

programmes. Government neglect of the agricultural economy is also linked to the pervasive oil-dependent structure of the Nigerian economy. In times of high oil prices, the Nigerian government has encountered no difficulties meeting the country's agricultural production shortfalls through massive food imports such as wheat, rice, poultry, and cooking oil. In times of low oil prices, the Nigerian government has encountered serious difficulties to pay for food imports. From 2013 to 2018, for instance, the government was forced to drastically curtail food imports due to the steady decline of oil export revenues. This situation aggravated food insecurity in the country, particularly among the most vulnerable sectors of the population.

The agricultural sector in the Nigerian economy continues to face serious challenges. Cereal production for instance has not been consistent due to insufficient government support such as inadequate credit, shortage of extension staff, negative weather conditions, poor infrastructure such as irrigation systems, storage facilities and poor road networks (see Figure 3). Other factors such as low soil fertility, harsh weather conditions, and high cost of production have also contributed to the inconsistent production of cereal (Njoku & Mijindaddi, 1985) As a result, cereal production has not been able to meet the demand of Nigeria's growing population. The stagnation of the Nigerian agricultural economy has contributed to declining levels of national food self-sufficiency, manifested by continuous dependency on food imports (see Figure 4), severe malnutrition (Figure 5), and significant loss of agriculture export opportunities (FAO, 2021).

Figure 3: Total cereal production in Nigeria 1961-2019 (million tonnes).

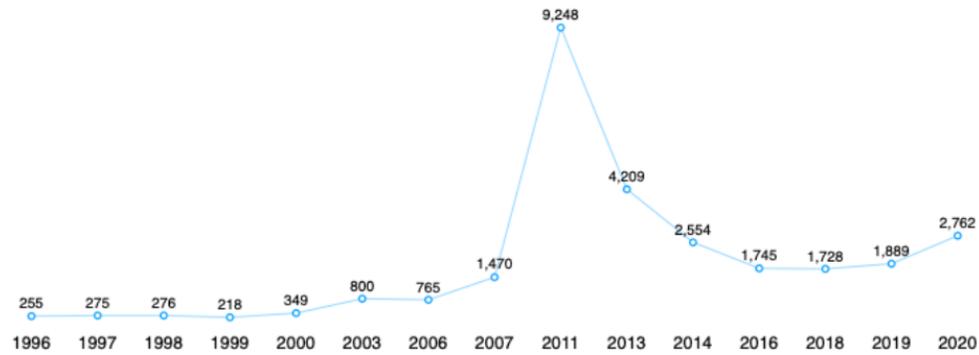


Source: FAOSTAT Selected Indicators. Accessed November 19, 2022.

Over the last two decades, the Nigerian government has made efforts to diversify its economy from dependence on oil resources towards agriculture, industrial, and mineral development. However, these efforts have encountered significant challenges. In the agricultural sector, for instance, the government has not adequately supported small-scale farmers with affirmative policies and programmes required to enhance their long-term sustainability and productivity. According to FAO (2021), the main factors facing small-scale farmers in Nigeria include inadequate access to land, credit, markets, insurance, fertilizers, transportation, and technology. Small-scale agricultural producers have also suffered from the negative effects of global warming. All these factors have significantly stifled the sustainability and productivity capacity of the small-scale agricultural sector in Nigeria. Even so, small-scale farmers and policy makers are confronting this situation by

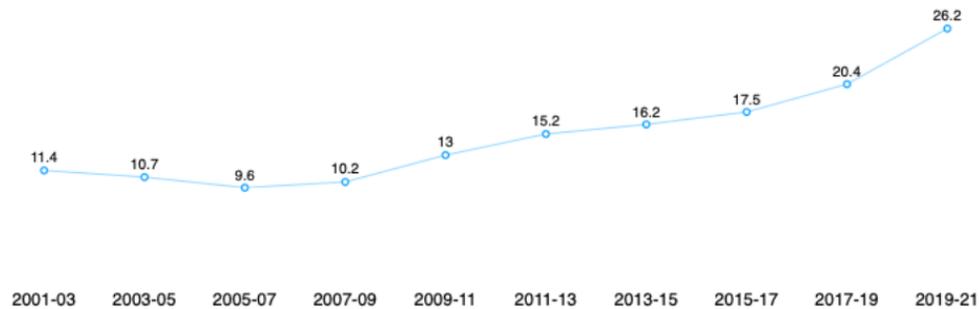
focusing on the importance of subsistence farming and its roles towards fighting food insecurity and poverty (Chiaka et al., 2022). This recognition has encouraged small-scale farmers to join agricultural cooperative production networks to enhance their livelihoods. Agricultural cooperatives offer small-scale farmers advantages that are often difficult to achieve when working individually to engender and advance food security (FAO, 2012) or food sovereignty (Robles & Veltmeyer, 2015; Robles, 2019).

Figure 4: Nigeria’s food products imports 1996-2020 (US\$ millions).



Source: FAOSTAT Selected Indicators. Accessed November 19, 2022.

Figure 5: Nigeria’s undernourished population; 3-year average (millions).



Source: FAOSTAT selected indicators, 2022.

2.1.1. Agriculture cooperatives in Nigeria. The history of agriculture cooperatives in Nigeria dates to 1933 when Strickland was appointed by the British Government to examine the geographical and economic conditions of Nigeria and recommend the types of cooperatives most suited for the country (Strickland, 1934). By 1934, several cooperatives had been formed in Nigeria. The first formed cooperative society was registered in Ibadan, southwestern part of Nigeria in 1937 (Adeyeye & Dittoh, 1985). The enactment of the Cooperative Society Law in 1935 facilitated the further development of cooperatives in Nigeria. This law, however, was framed to advance the economic interests of the British colonial administration (Develtere et al. 2008; Hyden, 1973). That is, the law responded to the British policy objectives of accessing raw materials from its colonies to fuel its industrialization. With this policy objective, the British promoted the establishment of the cooperatives in Nigeria to enhance its agricultural potential. The export of Nigerian-produced agricultural cash crops such as palm-oil, cashew nuts, cacao, and peanuts became

profitable commodities in Britain. The birth of the co-operative movement in Nigeria, therefore, was to meet the interests of the British colonial administration rather than the interest of the Nigerian people.

The Cooperative Society Law advocated for the provision of subsidised credit to cooperative producers and sellers. Since 1935, Nigerian cooperative societies have continued to expand (Harris et al., 1996). The Nigerian government has continued to support the main premises contained in the Cooperative Society Law. Agricultural cooperatives have enabled their members to increase their production, gain access to credit, eliminate intermediaries, and other government programs. According to Matthews-Njoku et al. (2003), agricultural cooperatives play an important role in meeting family farmers' production, processing, financing, and commercial needs. Agricultural cooperatives are very popular and common in Nigeria because of the services they provide to their members (Ebonyi & Jimoh, 2002; Ibitoye, 2012). The cooperative sector in Nigeria comprises spheres such as (a) credit, (b) marketing, (c) consumer, (d) agriculture/farmers, and (e) multipurpose cooperatives among others. Adeyemo (2004) notes that agricultural cooperatives have beneficial impacts on the small-scale farmers' management of the environment because their members have access to the information and resources necessary for tackling environmental and low food productivity problems.

There are many studies about agricultural cooperatives in Nigeria. Ibitoye (2012) for instance examined the performance of agricultural cooperative societies in Kogi State, Nigeria and discovered that the livelihood of cooperative farmers significantly improved as members of cooperative societies. Adeyemo (2004) examined the self-help farmer cooperatives' management of natural resources in Southwest, Nigeria and discovered that the cooperatives played major roles in promoting sustainable development among members and in their communities. Agbo (2000) found out that apart from providing services to their members, agricultural cooperatives also generate additional businesses for their members. Arua (2004) acknowledged that agricultural cooperatives nurture democratic values and practices among their members as they become involved in decision making processes.

Like in many developing countries, agricultural cooperatives in Nigeria have also experienced failures due to the inability of their members to cope with production, financing, and commercialization problems. Even so, cooperatives play an important role in providing economic opportunities for the poor: they join cooperative societies to pool their resources together to meet their needs (Ibrahim, 2001). This study aims at advancing alternative insights into the role of agricultural cooperatives in Nigeria by examining diverse factors that constrains or boosts cooperative efficiency. This objective requires that the cooperative sector respond to Nigerian needs and realities.

3.0 Research Methodology

This research used a quantitative method of data collection, which included semi-structured questionnaires and closed questions with a set of responses. Data was collected using a structured interview schedule to provide insight and an intimate view of the agricultural farm cooperatives. Data was collected from 45 participants comprised of 15 small-scale cooperative farmers from each of the three local governments. All questionnaires were administered in a face-to-face interview schedule. The survey questionnaire was divided into five sections and contained relevant questions based on the research objectives. Section A was designed to

obtain general information on the socio-demographic characteristics of the cooperative farmers. Section B collected information on the type of farming each respondent is engaged in and information on land use. Section C sorted information on farming practices such as seed type and use of fertilizers and pesticides. Section D assessed the yield of each respondents' operation, market access and sales, loans and earnings from farm and non-farm resources. Section E gathered data on farming costs and other factors that influence farming decisions. Finally, section F assessed the membership characteristics and features of the respondents in agricultural cooperative societies, the role of the agricultural cooperative societies in enhancing food production and the livelihood of small-scale farmers as well as what factors can enhance the role performance of the agricultural cooperative societies.

Most of the questions contained in the survey questionnaire were closed questions with pre-assigned responses. There were a few open-ended questions. For these questions, a list of the actual responses from each questionnaire was obtained. These responses were then categorised into themes, and each theme assigned a numeric code. A coding frame was then structured for both the closed and open-ended questions. The numeric code assigned to the open-ended questions was added to the coding frame. These numeric codes were entered into SPSS for the purpose of data entry.

Obviously, this research study has some limitations. A large portion of the data is based on interviews, a method that assumes that the participants will be honest and forthcoming. The participants were mostly family farmers with low level of education. Questions were asked repeatedly to ensure clear responses. Gaining access to the smallholder farmers was also an issue due to the poor road networks and insecurity in Nigeria. The familiarity of the researcher with the area helped in overcoming this obstacle. Research methodology approach was also restructured to ensure that findings remain valid and reliable despite the limitations. In ensuring the accuracy and consistency of the data, data cleaning, such as record matching, identifying inaccurate data, deduplication, and column segmentation were carried out to ensure data integrity. Data instruments were also made to adequately contain enough details to capture the information sought for. Questionnaires were in understandable forms and were cross-checked for internal consistency. Questions were in simple and understandable forms and translation was done in local language which the researcher speaks fluently.

The main research questions of this study were as follow:

- What are the socio-economic characteristics of the members of the agricultural cooperatives?
- How these cooperatives contribute for food production? What are the costs of production?
- Does agricultural cooperative society membership enhance access to agricultural inputs, access to credit, markets, and technology?
- To what extent has the Nigerian government supported the needs of the small-scale farmers' agricultural cooperatives?

3.1 General Characteristics of the Cooperative Farmers

In all, 45 interviews were conducted in the three local government areas of Oyo State, Nigeria. The breakdown of the interviews is given in Table 1 below. Fifteen interviews were administered in each of the three local government areas comprising 31 males (69%) and 14 females (31%) in total. For both the males and females, the split in each of the local government is shown in Table 1.

Table 1. *Gender Distribution of Cooperative Farmers*

Location	Gender	
	Male	Female
Local government area		
Ibarapa North	10 (66.7%)	5 (33.3%)
Ibarapa Central	12 (80.0%)	3 (20.0%)
Ibarapa East	9 (60.0%)	6 (40.0%)
Total	31 (68.9%)	14 (31.1%)

The median age of respondents is 31–50 years; and the median family size is one to five persons. Although most of the farmers have a large household of between six to 10 members, this did not translate to farm labour provided only by household members.

3.1.1. Educational Level of Cooperative Farmers. Table 2 reflects the educational level of the respondents. In total, 18 of the farmers (40%) have completed secondary education and 12 (27%) have completed post-secondary education.

Table 2. *Education Level of Cooperative Farmers*

Education	Gender		
	Male	Female	Total
No formal education	2 (4.4%)	2 (4.4%)	4 (8.9%)
Some primary education	3 (6.7%)	-	3 (6.7%)
Completed primary education	4 (8.9%)	2 (4.4%)	6 (13.3%)
Some secondary education	1 (2.2%)	1 (2.2%)	2 (4.4%)
Completed secondary education	13 (28.9%)	5 (11.1%)	18 (40%)
Higher education and above	8 (17.8%)	4 (8.9%)	12 (26.7%)
Total	31 (68.9%)	14 (31.1%)	45 (100%)

3.1.2. *Farming Experience of Cooperative Farmers.* Farming experience, as shown in Table 3, varied from 1 year to over 40 years ($M = 3.60$, $SD = 1.14$): 19 (42%) and 13 (29%) of the farmers have 11–20 and 21–30 years of farming experience, respectively. A total of 44 (98%) of farmers have over 5 years farming experience.

Farm size and Farmland Ownership. As shown in Table 4, over 40 members have farmland belonging to the family, while 5 rented their farmland.

Table 3. *Farming Experience of Cooperative Farmers*

Number of years in farming	Frequency	Percentage of total
1–5 years	1	2.2%
6–10 years	4	8.9%
11–20 years	19	42.2%
21–30 years	13	28.9%
31–40 years	4	8.9%
Over 40 years	4	8.9%

Table 4. *Farm Size and Farmland Ownership*

Farmland ownership	Total size of farms		
	1–3 ha	Over 3 ha	Total
Belongs to family	4	36	40
Rented	1	4	5
Total	5 (11.1%)	40 (88.9%)	45

While there are other uses of the farmland by the farmers, data collected indicate that most of the respondents allocated 30–50% of the farmland to planting maize and cassava.

3.1.3. *Type of Farming and Use of Seeds, Fertilizers, and Farm Tools.* Out of all the 45 farmers interviewed, 26 (58%) farmers practice mixed farming while 19 (42%) farmers practice solely crop farming. Maize and cassava were the most common crops planted by 45 and 44 farmers, respectively. Less than half of the respondents’ plant vegetables (18) and watermelon (12). The other main vegetables planted by these farmers include tomatoes, okra, pepper, sweet pepper, and cucumber, but the other crops planted were groundnut, sugarcane, potatoes, cashew, rice black eyed peas, and cocoa. In livestock farming, goat farming and poultry were the most popular and 14 and 15 respondents responded

to being involved in such farming. Traditional or normal seeds (36%), improved seeds (33%) and a mixture of both the normal and improved seeds (31%) were equally used. Thirty percent of seed came from previous harvest. Chemical fertilizers and chemical pesticides were typically applied 2–3 times during the planting season, as claimed by 35 respondents. Most cooperative farmers (84.4%) use rudimentary tools such as hoes, cutlasses and spades.

3.2 Food Production, Costs, and Income

3.2.1. Farming costs. On farming costs, 37 farmers spend 10% of their farming budget on seed purchase; 20 spend between 40–60% of their farming budget on the purchase of fertilizers and pesticides, while 29 respondents spend between 40–70% of their farming budget on farm labour. Twenty-nine farmers, which are more than half of the respondents, claimed that labor cost was 40% and above of the total farming costs, while 20 respondents claim that the cost of the purchase of fertilizer and pesticide was 40% and above of the total farming costs. Weeding, fertilizers and pesticides costs contributed to the high farming costs. Of all respondents, 27 stated that cassava is the most expensive crop to farm while 13 farmers say maize is the most expensive crop to plant.

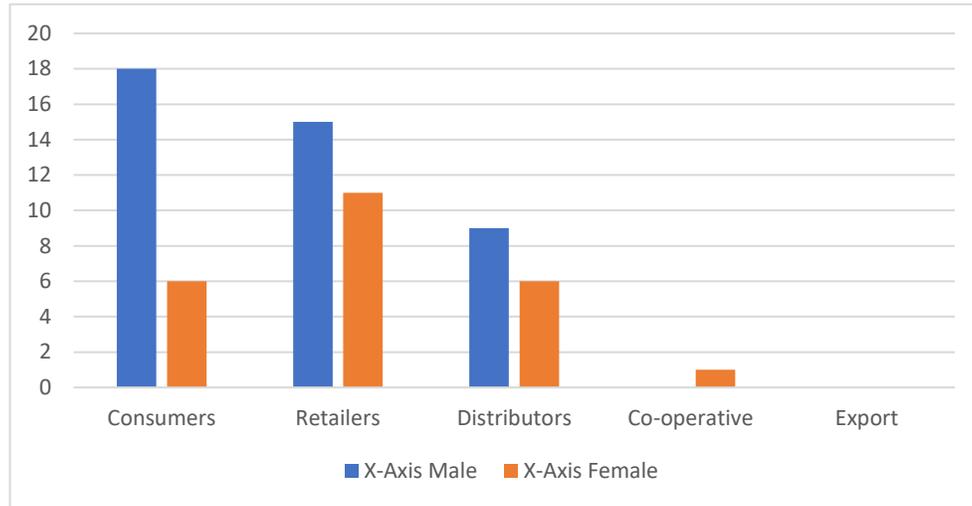
3.2.2. Farming decisions. The main factors influencing decisions about what to plant during each planting year are the price that is expected to be derived from the sales of the crop and the demand for such crop during the farming year. Forty (89%) of the farmers stated that price is the main factor that influences their decision while 32 (71%) farmers claimed that demand for a particular crop is the main factor that influences their decision on what to plant.

3.2.3. Sales of farm produce. Thirty-three (73%) farmers sold over 90% of their farm produce during the last planting season, yet this decision did not result in high income for the farmers. Eight (18%) farmers sold between 70%–90% of their produce, while only 4 (9%) respondents sold below 70%. Some reasons given for this low income include farm destruction by herdsmen, excessive rainfall leading to the destruction of crops, instability of market price and low demand.

The price is the returns from the market after selling their products. What the farmers do is to forecast what the price of selling the farm produce in the market will be. If they expect a high price, that influences what will be planted on the farm.

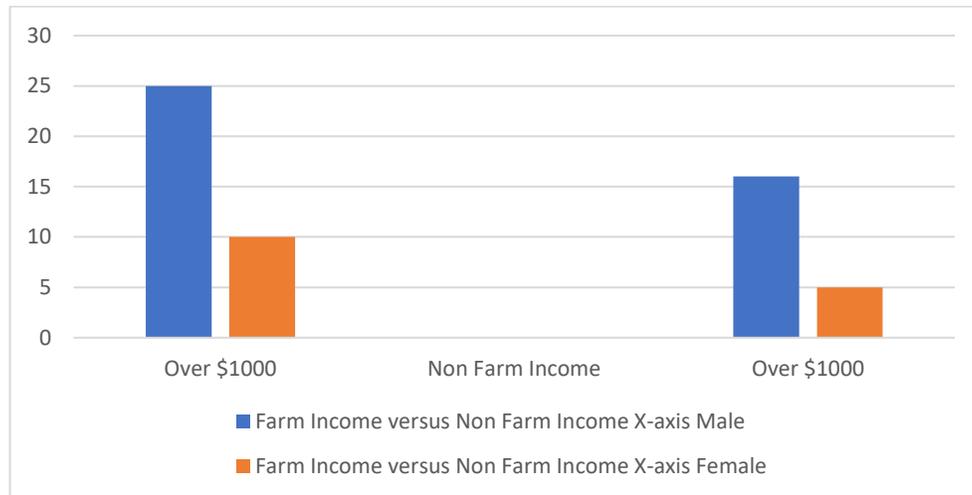
3.2.4. Sales outlet for crops. As shown in Figure 6, all the respondents used a combination of outlets for selling their produce. Twenty-four producers (18 males and 6 females) sold their crops directly to consumers; 26 respondents (15 males and 11 females), sold their farm produce to retailers. A total of fifteen respondents (9 males and 6 females) sold their produce to distributors, while only 1 respondent sold her farm produce to the cooperative. No produce was sold for export by any of the farmers.

Figure 6: Crop sales outlet by gender.



Farm and non-farm income. Thirty-five respondents comprising of 25 males and 10 females make a yearly farm-income of over US\$1,000; 21 respondents, comprising of 16 males and 5 females make additional income of over US\$1,000 from non-farm businesses. Typical sources of non-farm income include petty trading, small and mid-size enterprises, pensions, family businesses, and full-time employment. As seen in Figure 7, the most common source of non-farm income is the small and mid-sized enterprises, as stated by 23 respondents.

Figure 7: Farm and non-farm income.



3.3 Features of Farmers' Cooperative Societies

3.3.1. Cooperative societies and length of membership. Responses were received from 18 agricultural cooperative societies from the three local governments. The membership size of the cooperative societies ranges from between 25 to 15 members. Twenty-eight respondents, representing more than half of all the respondents, have been in the cooperative societies for more than 5 years. Thirteen respondents have been in the cooperative societies for between 6–10 years, while 13

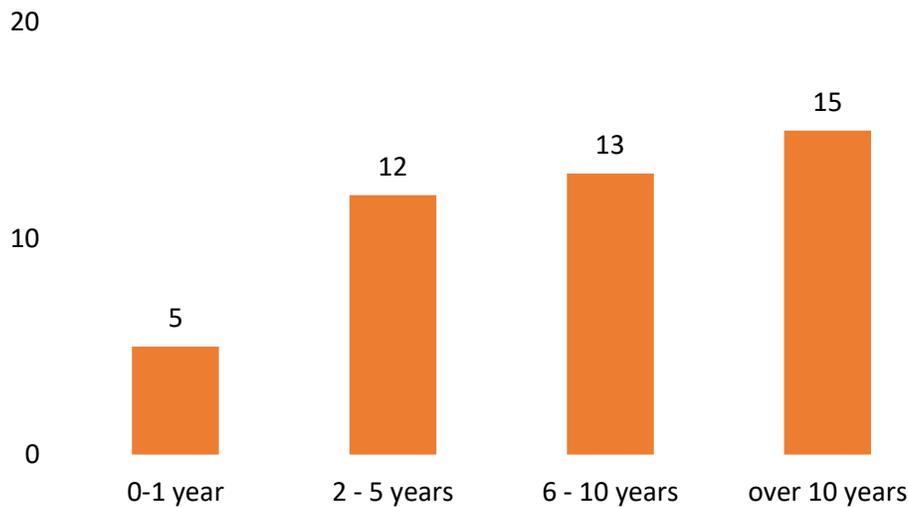
respondents have also been in the cooperative societies for over 10 years. The length of membership in percentages are: 0–1 year (5, 11.1%), 2–5 years (12, 26.7%), 6–10 years (13, 28.9%), over 10 years (15, 33.3%). 26.7% of the male respondents have over 10 years of cooperative membership, and 17.8% have between 2–5 years of membership. Among the females, 11% have maintained their membership for 6–10 years and 8.9% for 2–5 years. The length of membership is shown in Figure 8. The locations of the cooperative societies are in Table 5.

Table 5. *Cooperatives Surveyed by Location*

S/N	Name of cooperative society	Membership size	Sample size
Ibarapa Central Local government			
1	Ajetumobi Farmers' Cooperative Society	25	5
2	Ifesowapo Farmers' Cooperative Society	25	6
3	Ifedapo Farmers' Cooperative Society	25	2
4	Ifenirepo Farmers' Cooperative Society	15	1
5	Asejere Farmers' Cooperative Society	15	1
Ibarapa North Local Government			
1	Ifeloju Farmers' Cooperative Society	15	1
2	Binukonu Farmers' Cooperative Society	15	7
3	Agbedola Farmers' Cooperative Society	20	4
4	Boluwatife Farmers' Cooperative Society	15	1
5	Aduragbemi Farmers' Cooperative Society	15	1
6	Iwajowa Farmers' Cooperative Society	15	1
Ibarapa East Local Government			
1	Asejere Farmers' Cooperative Society	20	4
2	Ifeloju Farmers' Cooperative Society	25	1
3	Ise Logun Ise Farmers' Cooperative Society	25	4
4	Ifesowapo Farmers' Cooperative Society	20	2
5	Omolayo Farmers' Cooperative Society	15	1
6	Ayomide Farmers' Cooperative Society	20	2
7	Itesiwaju Farmers' Cooperative Society	15	1

Source: Field survey, 2019; SN = serial number.

Figure 8: Length of membership.



3.3.2. *Cooperative membership and participation.* Membership of the cooperative societies is open to all farmers in the three local governments. There is no age, gender, disability, ethnic, or religious considerations or restrictions. Although most the farmers responded ‘No’ on disabled members, none of the cooperative societies have ever had a disabled member. Forty-four (98%) farmers reported that membership fee is the most important obligation of being a member of the cooperative society. Thirty-seven (82%) farmers responded that attendance of meeting is another important obligation while five respondents (11%) reported that active membership participation as another important obligation. The participation of the cooperative members is shown in Table 6.

Table 6. *Cooperative Membership and Participation*

Membership obligation	Frequency	Percentage
Membership dues/fees	44	97.8%
Meeting attendance	37	82.2%
Active membership	5	11.1%

3.3.3. *Cooperative benefits.* Data collected shows that most of the farmers are of the opinion that access to small loans and training are the most important benefits of belonging to the cooperative society. Out of the total membership, 48.8% said that access to small loans is the most important factor of belonging to the cooperative society and 37.7%, said that training is the most important benefit. A significant 22.2% of the respondents said they have not received any benefit from being members of the cooperative societies, while 11.1% have received help from the cooperative societies because of conflicts arising when their farms were destroyed by cattle herdsmen grazing on them.

3.3.4. *Complaints against cooperative societies.* Data collected shows that the major complaint against cooperative societies is in inaccessibility to loans and funds by farmers. A majority of the respondents, specifically 57.8% of the total respondents, agreed with this assertion; 13.3% of the farmers indicated that an area of improvement for the cooperative is in making farm equipment like tractors available for hiring by farmers. All the farmers confirm that a major issue is the destruction of their farms by the cattle herdsmen although all the respondents are aware of the limitations that the cooperative societies have in providing the necessary security assistance.

4.0 Relationship Between Socio-economic Characteristics of Farmers, Benefit of Being a Cooperative Member and Food Production

To identify the extent of the contributions of small-scale farmers to agriculture, the study examined if there is any relationship and impact between the socio-economic characteristics of farmers, benefits of being a cooperative member and food production. The methods used were correlation and regression analysis. Data was analysed using Pearson correlation analysis to identify any relationships in the variables of socio-economic characteristics of the farmers and productivity (yield and income). With a sample size of 45, the results revealed a positive correlation between age and family size, $r(45) = .537, p < .001$, age and years in farming, $r(45) = .538, p < .001$, and years in farming and family size $r(45) = .448, p = .002$. Correlations were significant at $p < .01$ and $p < 0.001$. This means that there is a positive association between these. Family size and length of years in farming also have a positive correlation. This suggests that a larger family size would increase the years in farming and should reduce the cost of hired labour. However, the practice revealed by 95% of all the respondents' shows that hired labour is employed for the different farming stages rather than family members. The respondents claim that family members are not interested in the hard labour. It therefore means that farm size, which is depicted by the size of hired labour, is indirectly related to the years in farming. The more the farmer can hire labour, the longer the farmer is able to maintain the farm.

As shown in Table 7, it is interesting to note that there was a weak negative correlation between education and farm income, $r(45) = -.313, p = .037$, significant at $p < .05$. This suggests that the level of education, which would generally imply an understanding of better farming methods or experience, does not necessarily translate to farm income. However, the correlation co-efficient r does not reveal the extent of the impact of these variables on each other.

Table 7. Correlation–Socio economic Characteristics of Farmers and Productivity

		Yield compared with previous years	Income earned from farm/year NGN	Total size of farm -hectare	Family size	Education	Age	Years in farming
Yield compared with previous years	Pearson Correlation	1						
	Sig. (2-tailed)							
Income earned from farm/year NGN	Pearson Correlation	.231	1					
	Sig. (2-tailed)	.127						
Total size of farm (hectares)	Pearson Correlation	.099	.410 **	1				
	Sig. (2-tailed)	.518	.005					
Family size	Pearson Correlation	.174	-.155	-.048	1			
	Sig. (2-tailed)	.254	.311	.754				
Education	Pearson Correlation	-.313 *	.041	.000	-.060	1		
	Sig. (2-tailed)	.037	.789	1.000	.695			
Age	Pearson Correlation	-.099	-.204	.015	.537 ***	-.120	1	
	Sig. (2-tailed)	.520	.180	.924	.001	.431		
Years in farming	Pearson Correlation	.233	.025	.189	.448 **	-.122	.538 **	1
	Sig. (2-tailed)	.124	.872	.214	.002	.423	.001	

Note: * p<.05, ** p<.01, *** p<.001; NGN=Nigerian Naira; Correlations N=45

To assess the impact of the association of these variables, the same variables were subjected to multiple linear regression analyses. Regression is a technique that is appropriate to understand the association between one independent (or predictor) variable and one dependent (or outcome) variable. The result of the regression indicated that one predictor (independent variable), farm size explained 26% of variability of the dependent variable, farm income ($R^2 = .256$, $F(6, 44) = 2.17$, $p = 0.067$). Socio-economic variables, Farm size ($\beta = .37$, $p = .01$) significantly predicted farm income. This indicates a change in farm size will describe 26% of the changes in Farm income. Simply put, the result of the regression suggests that if other variables are constant, the farm can predict 26% of the farm income. The unstandardized coefficients (B) indicates that, for every unit increase in farm size (hectare), one can expect or predict an increase by .378 units in farm income. Again, according to all the respondents, this is the trend if other farm cost and market variables are managed. Family size, Age of the farmer have negative coefficients, which were not statistically significant. As seen in Table 8, this meant that each of these variables has no impact on the farm income provided the other variables held constant. The regression analysis showed that these variables cannot be used to predict an impact on farm income.

Table 8. *Model Coefficients–Socio Economic Characteristics of Farm Income*

Model	Unstandardized Coefficients		Standardized Coefficients Beta	t	Significance
	B	Standard Error			
1 constant	.359	.752		.477	.636
Total size of farm (hectares)	.644	.203	.423	3.181	.003
Family Size	-.085	.116	-.116	-.729	.471
Education	.029	.040	.096	.728	.471
Age	-.036	.159	-.041	-.228	.821
Years in farming	-.040	.074	-.094	-.539	.593
Yield compared with previous years	.326	.108	.441	3.035	.004

Data was analyzed using Pearson correlation analysis to identify any relationship between cooperative member benefits of farmers and productivity, that is, the relationship between being a member of a cooperative society and their yield and income. The cooperative benefits variables are: (a) training, (b) access to loans, (c) farm inputs/equipment, (d) cattle herdsman issue, and (e) books/manuals. Pearson correlation analysis revealed the following positive correlations: Years of membership and access to small loans, $r(45) = .327$, $p = .029$. Membership obligations such as regular payment of membership dues, meeting attendance and

active membership were all part of the consideration for access to loans by all respondents. Farmers also mentioned that the length of membership in a cooperative society was also a consideration for access to loans. The length of membership builds credibility for the farmer and commitment to the cooperative. This confirms the positive association. Yield and access to loans also show the following result: $r(45) = .302, p = .044$. Correlations were significant at $p < 0.05$.

There is a positive association between these variables. However, the correlation coefficient r does not reveal the extent of the impact of these variables on each other. However, it is interesting to note that there was a non-significant correlation observed relationship between training versus yield and income ($-.055, .206, p=ns$), access to loan and farm income ($-.151, p=ns$) and years of membership and income ($-.125, p=ns$). This suggests that training may not improve farming knowledge that could significantly lead to improved yields. In addition, access to loans and length of membership may not necessarily increase farm income. Other factors, such as destruction of farmlands by cattle herdsman, weather fluctuations may be involved leading to loss of income.

The same variables were subjected to multiple linear regression analysis to assess the impact of the association of these variables. The independent variables are: (a) the cooperative benefits–training, (b) access to loans, (c) farm inputs/equipment, (d) help with cattle herdsman issue, (e) books/manuals, and (f) the dependent variable–farm income. The result of the regression indicated that the regression model was not significant ($R^2 = .011, F(5, 44) = 1.102, p = ns$). This means that none of the cooperative benefits can explain or predict any variation in farm income.

The interviews with the farmers clearly suggest that cooperative membership, although helpful to the farmers to a certain degree, still has a long way to go in assisting the farmers without the intervention of the state or government. Access to loans, farm inputs and equipment and other benefits are very limited. Although cooperative societies offer limited assistance in cases regarding the destruction of farmlands by cattle herdsman, they do not offer funding or legal backing for such cases because the cooperative societies themselves lack the funds. In addition, there is little or no assistance from the government in terms of funding. The cooperative benefits enjoyed by the members are not on a scale that could have great impact to the farm income of the farmers. This is shown in Table 9.

Using the socioeconomic and cooperative benefit variables in a regression model to predict farm yield show the values, $R^2 = .653, F(11, 44) = 2.823, p = 0.03$, predicted by three variables: access to loans, length of cooperative membership and cooperative benefit–education, $p < .05$. In the table below, the b coefficient values tell us about the relationship between farm yield and each predictor. In these data, the predictors access to loans and education have a negative value, while the length of membership has a positive value. In other words, it suggests that as access to loans and education increases, farm yield decreases. Access to loans and education increases farmers' financial and social status, leading them to shift away from traditional farming, leading to decrease in farm yield. This, however, was not the case observed. The b values also tell us to what degree each predictor affects the outcome if the effects of all other predictors are held constant. The standardized beta values for access to loans ($-.341$) and length of membership ($.363$) tells us these variables have a larger impact in the model than education ($.276$). This is shown in Table 10.

Table 9. *Model Coefficients–Membership Benefits on Farm Yield*

Model	Unstandardized coefficients		Standardized coefficients	t	Significance
	B	Standard error	Beta		
Constant	1.42	.429		3.317	.002
Cooperative benefit training	-.286	.299	-.145	-.957	.345
Cooperative benefit access to loans	-.083	.281	-.436	-2.960	.005
Cooperative benefit farm inputs	.021	.330	-.095	-.662	.512
Cooperative benefit Fulani herdsmen	-.048	.441	.015	0.109	.914
Cooperative benefit books/manual	-.839	.660	.181	1.273	.211
Length of membership	.408	.136	.433	2.998	.005

Farmers were presented a set of statements regarding their perception of the relevance of cooperatives. The statements measuring relevance of cooperatives are:

- cooperatives promote socio-economic development
- cooperatives help ensure food sovereignty
- cooperatives help in poverty reduction
- cooperatives help to generate employment
- cooperatives provide accessible financial services
- cooperatives improve gender equality
- cooperatives promote rural enterprise
- cooperatives provide accessible healthcare

Table 10. *Model Coefficients—Benefits and Socioeconomic Variables on Farm Yield*

Model	B	Standard Error	t	Significance	Beta
Constant	2.3044	1.5070	1.5291	0.136	
Cooperative benefit training	-0.2690	0.3024	-0.8895	0.380	-0.1369
Cooperative benefit access to loans	-0.6507	0.2996	-2.1721	0.037	-0.3416
Cooperative benefit inputs	-0.0229	0.3489	-0.0657	0.948	-0.0100
Cooperative benefit herdsmen	-0.0452	0.4499	-0.1005	0.921	-0.0149
Cooperative benefit books	0.7556	0.6531	1.1569	0.256	0.1635
Length of membership	0.3430	0.1533	2.2378	0.032	0.3638
Farm size	0.0870	0.4375	0.1988	0.844	0.0287
Family size	0.3677	0.2408	1.5265	0.136	0.2525
Education	-0.1662	0.0835	-1.9898	0.055	-0.2764
Age	-0.4883	0.3379	-1.4452	0.158	-0.2754
Years in farming	0.0602	0.1649	0.3652	0.717	0.0710

Note: P < .01

A reliability analysis was carried out on the perceived task values scale comprising nine perceived relevance statements. The Cronbach's alpha coefficient test was employed here. Cronbach's alpha shows alpha $\alpha = .657$. The closer Cronbach's alpha coefficient is to 1.0, the greater the internal consistency of the items in the scale. Most items relating to the relevance of cooperative appeared to be worthy of retention, resulting in a decrease in the alpha if deleted. The exception to this was item 'cooperatives promote socio-economic development', which would increase the alpha $\alpha = 0.746$. As such, this statement was removed. The remaining eight statements were analysed using Spearman's correlation test and not Pearson correlations because the responses were ranked.

The statements measuring the relevance of cooperatives revealed significant relationships with the following statements:

- Moderate positive correlation was found between the statement ‘cooperatives promote rural enterprise’ versus ‘food sovereignty’, $r(45) = .476, p < .01$, and ‘poverty reduction’, $r(45) = .416, p < .01$.
- By implication, cooperative societies assist farmers with loans at very low interest compared to the banks. This is very helpful to the farmers in the reduction of poverty.
- Moderate to strong positive correlation was found between the statement ‘cooperatives provide livelihood for the poor’ versus ‘generate employment’, $r(45) = .614, p < .01$, ‘poverty reduction’, $r(45) = .495, p < .01$, and ‘financial services’, $r(45) = .435, p < .01$. By implication, cooperative societies indirectly provide employment for hired farm labour through loans offered to farmers for farming operations.
- Moderate positive correlation was found between the statement ‘cooperatives help generate employment’ versus ‘poverty reduction’, $r(45) = .548, p < .01$.
- All other correlations were observed to be very weak.

Tables 11, 12, 13, 14, and 15 show the frequencies for each of the statements.

Table 11. *Cooperative Benefit–Socioeconomic Development*

Valid	Frequency	Percent
Don’t know/no answer	3	6.7
High	29	64.4
Medium	5	11.1
Low	8	17.8
Total	45	100.0

(M = 1.40; SD = 0.863)

Note: 64.4% of all the 45 respondents agree that cooperatives promote social economic development of the members.

Table 12. *Cooperative Benefit–Poverty Reduction*

Valid	Frequency	Percent
Don't know/no answer	1	2.2
High	18	40.0
Medium	18	40.0
Low	8	17.8
Total	45	100.0

(M = 1.73; SD = 0.780)

Although 80% of all the farmers agree with the statement that cooperative societies help in poverty reduction, this has an equal split between the medium perception and the high perception of 40% each. Sixty percent of the respondents agree that cooperatives help to generate employment. Still, 37.8% of the respondents are, however, of the opinion that cooperatives do not help to generate employment.

Table 13. *Cooperative Benefit–Financial Services*

Valid	Frequency	Percent
High	17	37.8
Medium	9	20.0
Low	19	42.2
Total	45	100.0

(MD = 2.04; SD = 0.903)

Although 57.8% of all the farmers agree that cooperatives provide accessible financial services, they also agree that access to such loans was very limited. Some of the farmers claim not having received any financial assistance since becoming members of the cooperatives. Of the total respondents, however, 42.2% do not agree with the statement that cooperatives provide accessible financial services to members. Cooperatives encourage women farmers and there is no gender discrimination. Close to 90% of all the respondents agree to the statement that agricultural cooperative societies promote women farmers.

Table 14. *Cooperatives Benefit–Rural Enterprise*

Valid	Frequency	Percent
Don't know/no answer	1	2.2
High	15	33.3
Medium	19	42.2
Low	10	22.2
Total	45	100.0

(MD = 1.84; SD =0.796)

Most of the farmers agree that cooperatives promote rural enterprise.

Table 15. *Cooperatives Benefit–Accessible Healthcare*

Valid	Frequency	Percent
High	3	6.7
Medium	2	4.4
Low	40	88.9
Total	45	100.0

(MD = 2.82; SD =0.535)

Most farmers (88.9%) agree that cooperatives do not provide any form of accessible healthcare to the members.

5.0 Conclusion

Empirical evidence from this study supports the following conclusions:

- Agricultural cooperative societies in Nigeria play a subsistence role in the country's national agricultural economy. They are a source of minimal income for the vast number of their members. The cooperatives offer their members basic services that help them to produce basic agricultural crops for consumption in the local markets. They do not the productive capacity to meet the food needs of the country's growing population.
- The cooperative societies in Nigeria do not receive proper supported from the government. They do not have adequate access to financial, educational, technological, commercial, and human resources to increase their productivity. The lack of proper government support has not helped the cooperatives to achieve a sustained increase in staple crop yield. In sum,

poor support mechanisms, and production and infrastructure problems hinder the food production capacities of the cooperative producers. These producers still use rudimentary technology and are themselves unskilled. The hectareage operated per farm household is relatively small. Clearly, there is a lack of technical knowledge among the cooperative members. The cooperative farmers are also limited to selling their farm produce in local markets and immediate communities. This restriction hinders opportunities to expand production and generate steady income.

- The socio-economic characteristics of the small-scale farmers show that most of them are males with long years of farming experience and with a relatively large household size. With their immense collective knowledge and experiences of local conditions, the cooperative farmers hold many of the practical solutions that can engender food sovereignty. What is required is a re-orientation of the agricultural sector by the Nigerian government by properly positioning the small-scale agricultural cooperatives at the centre of the agricultural policy decisions.
- The agricultural cooperative societies are established by like-minded farmers to pursue mutually beneficial economic interests. They provide goods and services to members and the public in cost effective ways, prevent exploitation of members through self-help projects. The cooperatives defend and protect the right of their members as producers and consumer of goods and services and promote mutual understanding and peaceful co-existences among the people. This is true of the agricultural cooperative societies in the three study areas. Unpredictable weather, such as too much rain, is a major hinderance to crop yields. The year that this study was conducted (2019), for example, too much rain greatly affected the food production negatively. Even so, the cooperative members helped each other to address their common problems.
- There is a low capital outlay and weak business performance among the cooperative societies. Cooperatives need to take on services and businesses that also make commercial sense and, to support these activities, depend on the capital of members or external financing. Access to loans by the farmers within the cooperative society is a function of how much savings they have with the cooperative society. If, for instance, a farmer has 1,000 dollars in savings, then the cooperative can only loan 2,000 dollars, which, must be guaranteed by sureties who can guarantee that you can pay back. This is a major hinderance to cash flow among the cooperative members. The Bank of Agriculture established by the government to facilitate quick access to funds by the farmers has not been supportive to the farmers. The Bank of Agriculture asks for hard collateral from these subsistence farmers which many are unable to provide.
- The cost of selling crop produce is unstable and highly unpredictable. Profit margins are highly unstable and often fluctuate. Sometimes farmers use about US\$1,000 dollars for land preparation and planting and make a profit of US\$2,000 dollars, but in other years, they can use US\$2,000 dollars to prepare the land and lose all. The farmers have also not learned how to preserve some of the farm crop produced. Watermelon and golden melon, for instance, cannot be preserved, so if they cannot be sold early, they rot, which reduce the profit margins of the farmers. Also, there is no

preservation method for harvested farm produce among the smallholder farmers. Although there is technology to address these problems, their adoption by farmers is constrained by a lack of information.

- If Nigeria is committed to tackling food insecurity, then government needs to play a significant role in supporting all sectors of the agricultural economy, particularly small-scale and agricultural cooperatives, by providing access to financial, educational, technological, and human resources. Only the active participation of cooperative members and government agencies in the agricultural sector can boost food production and secure food sovereignty. Small-scale agricultural cooperative societies must play an important role in this process.

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