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PATRONIZING AGRICULTURAL COOPERATIVES: THE JOURNEY TOWARDS ZERO HUNGER ATTAINMENT IN SOUTH-SOUTH STATES, NIGERIA

[1]Okwuokenye, G.F. and Ovharhe O. J.[2]
[1]Department of Agricultural Economics and Extension, Faculty of Agricultural Sciences, National Open University of Nigeria, Kaduna, Kaduna State.
[2]Department of Agricultural Economics and Extension, Faculty of Agriculture, Delta State University, Asaba Campus, Asaba

ABSTRACT: *The study focused on farmers patronizing agricultural cooperative societies as a journey towards zero hunger attainment in South-South States, Nigeria. A multi-stage sampling procedure was used to select a sample size of 144. A validated questionnaire was used to obtain data from respondents. Descriptive and inferential statistics were employed to analyze the data obtained. Results showed that the average age, farming experience, household size, farm size and annual farm income were 46 years, 11 years, 6 persons, 3 Ha and ₦282,638.89 respectively. The level of participation of the respondents activities in their groups was highest in payment of monthly dues and other necessary contributions (mean = 3.60) and the most benefit derived was increased human capacity development in farming (mean = 3.48). In addition, most (59.03%) of the cooperators indicated their high level of satisfaction with the groups they belong. Regression results showed that respondents derived significant ($p<0.05$) benefits from their belonging to cooperative groups. It was concluded that farmers were satisfied by patronizing cooperative societies as a strategy to attain zero hunger amongst households. The study recommends that there should be awareness creation for new entrants to join cooperative societies so as to accomplish zero hunger.*

KEYWORDS: benefits, cooperative societies, farmers, participation, satisfaction, zero hunger

INTRODUCTION

The country, Nigeria, has witnessed a steady increase in the Gross Domestic Product (GDP) on to which agriculture was its major contributor and it rose from 568.59 Billion USD in 2014 to 375.77 Billion USD in 2017 (Nigeria GDP, 2019). The production increase as it were has not been able to meet up with the food demand of the populace due to its explosion which stands at 196,661,403 as at September, 2018 (NPC, 2018). Production lag has also been due to the characteristic poor nature of many of our small scale farmers who are targeted for increased food production because of their total contribution (85%), coupled with strong dependence on agricultural labour market, poor cultural practices adopted by farmers and little or no forms of savings or storage facilities (Adebayo and Okuneye, 2005).

The term "zero hunger" is associated with the second item in the Sustainable Development Goals (SDG) agenda. It is a global situation involving absence of hunger amongst households. Acute hunger is a major portion of the zero hunger challenge (Sustainable Development, 2019). A world food programme that prevents food wastage and create a world where there is no hunger. The SDG programme intend to tackle food security issues and guarantee balanced nutrition accessibility to all. The hungry and

malnourished population (approximately 821 million) live in developing nations predominantly in sub-Saharan Africa. Hunger increases death rate among children annually (Sustainable Development, 2019). In order to overcome these challenges and meet up with food security of the country, Ofuoku and Urang (2009) advised that farmers should begin to function as a group. Precisely, the authors advanced that participating in agricultural cooperative societies in particular is a means to shorten the gap of food insecurity and also do well in the transformation of the rural areas. Ofuoku and Urang (2009) as well stated that the gap serves as the avenue through which the members meet up with their financial obligations to their investments. Ekundayo (2008) concurred that agricultural cooperative society has been taught of as the surest means of harnessing and pulling the resources of millions of small-scale farmers together in order to enjoy the benefit of large scale production.

Cooperative society is defined as an autonomous association of persons united voluntarily to meet their common economic, social and cultural needs and aspirations through a jointly-owned and democratically-controlled enterprise (ICA, 2009). The report also added that the members pull their resources together in order to reap the advantage of large scale production and access to loan from financial and non-financial institutions. Farinde and Adisa (2005) noted that as an organization, the cooperative societies could be formal (when registered) or informal (if unregistered) and that they are involved with thrift and credit activities as well as the pooling of agricultural labour and extension activities. In terms of reliability, they stamped that agricultural cooperative societies are reliable sources of information on improved practices and new technologies to farmers. Though these are guided by the farmers' perceptions.

Satisfaction is one of the indicators derived from participating in cooperative society. Farmers join cooperative social groups because they want to improve on farming ventures and livelihood standards. Cooperative societies performance is linked to sense of belongingness and participation of members in cooperative activitities which leads to satisfaction (Wani, Sankhala, Singh, and Chahal, 2015). Ike (2016) asserted that group formation contributed to beneficiaries satisfaction with poverty alleviation projects such as rural infrastructures and productive assets which resulted to increase in income generation. Again, Ovharhe (2014); Ovharhe, Oyibo and Alakpa (2016) established that beneficiaries of Fadama III, as a result of farmers' group participation, expressed satisfaction in the operation, utilization and maintenance of agricultural projects and donated social amenities.

Consequent upon these achievements, the farmer then develops an attitude towards the group formation and sees how to make best use of it in line with increased food production, food security assurance *viz*, zero hunger attainment. Food security however, refers to a situation where all individuals at all times have physical, social and economic access to adequate, safe and nutritious food requisite to meet their dietary needs and choices to maintain a healthy and active life (Alimba *et al.,* 2018).

The objectives of cooperative societies basically include access to funds, for the improvement and enhancement of the participants' production level, income and standard of living (Ekong, 2003). In spite of these laudable objectives, not much seem to have been researched on how cooperative societies could help improve the food security status of the country. Very few, if any seemed to focus on achieving food security through patronizing agricultural cooperative societies. This study therefore bridges this gap. Against this background the study aims to examine the farm characteristics of the farmers in cooperative

societies in the study area, categorize the farmers level of participation in cooperative societies in the states, ascertain the benefits derived by respondents from cooperative societies in the states; and determine the level of satisfaction of the farmers with their cooperative societies in the area of study.

The hypotheses of the study were stated in their null forms:
i. Farmers socio-economic characteristics have no significant relationship with the benefits derived from their cooperative societies.
ii. Proportion of farmers satisfied with their cooperative societies was not significantly different from those not satisfied.

Conceptual framework for the study

The conceptual framework for the study is aligned with cooperatives membership participation in farming activities thus deriving benefits and satisfactions towards zero hunger attainment in the study area (Figure 1). Ovharhe (2019a) pointed out that peceptual frameworks are necessary for effective agricultural project design and implementation. Farmers levels of participation are noticeable in registration, payment of monthly dues, repayment of revolving loans with interests, and other necessary contributions, abiding by rules of the cooperative societies, attendance of human capacity development programmes and meetings. Thus, zero hunger is a network function of high levels of participation in these activities leading to benefits and satisfaction in improved farm outputs, income, outcome and improved standard of living amongst others which catapult farmers from acute hunger to zero hunger attainment. Zero hunger is tantamount to food security pursuits.

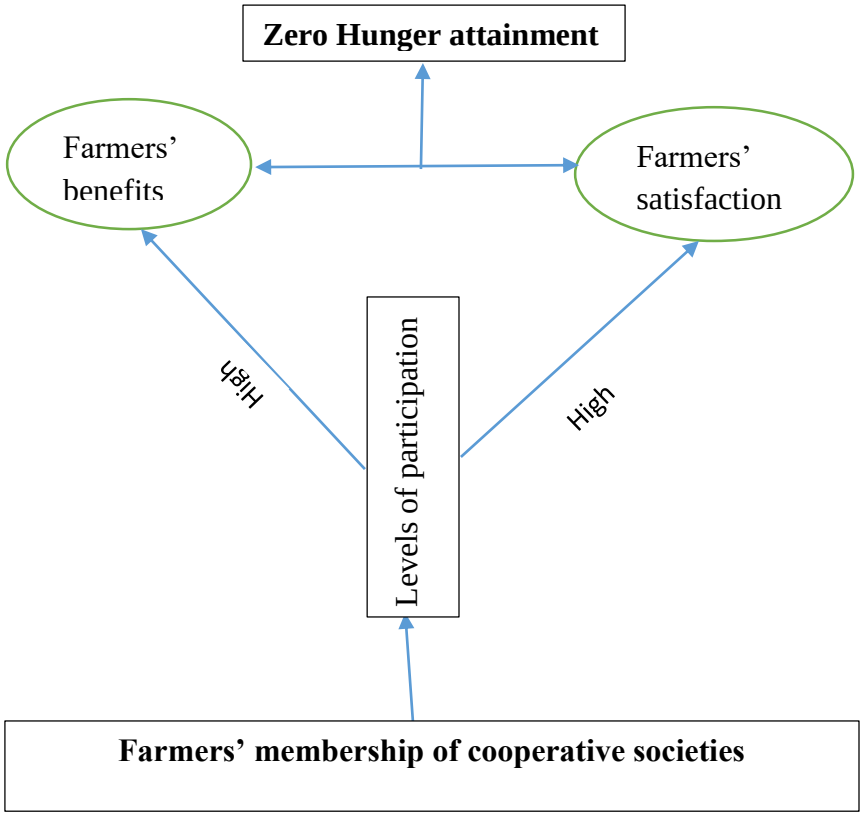

Figure 1: Conceptual framework for cooperatives towards zero hunger attainment

Methodology

The study was carried out in two contiguous states (Delta and Edo States). Delta State is one of the six South-South States along line with Edo, Rivers, Akwa-Ibom, Bayelsa and Cross Rivers States of the Niger Delta area of Nigeria. Delta State is an oil and agricultural producing state of Nigeria, situated in the South-South geopolitical zone with a projected population of 5,663,400 as at 2016 (NPC, 2018). Geographically, the State lies between longitudes 5.00^0 and 6.45^0 North and latitude 18^0 and 23^0 South. The habitats are into oil prospecting, trade and commerce, civil service jobs and farming.

Edo State is another one of the six South-South States. It is one of the oil rich producing state, with 18 LGAs and has its capital seat at Benin city with an estimated population of 4,235,000 as at 2016 (NPC, 2018). Edo state lies roughly between Longitudes 05.04^0E and Latitudes 05.44^0N and 07.34^0N. The report also stated that Edo State is rich in agricultural production as it is known to produce major crops like rubber, timber, oil palm, cocoa. It is also richly endowed with minerals like marble, lignite, gold, lime stone, quartzite among others.

Sampling Technique
Multi-stage random procedure was adopted for selecting the respondents (Table 1).

Table 1: Selection of agricultural zones, LGAS and cooperative societies used for the study

State/Agricultural zones	LGAs	Cooperative societies	Sampled members (50%)
Delta			
Delta North	Ika North East	Otu – Oganishu multi-purpose cooperative society Ute-Ogbege	12
		Ika North East oil palm processor farmers' multi-purpose cooperative society – Boji – Boji. Owa.	13
	Ndokwa East	Onyema farmers' multipurpose cooperative society - Afor Town	13
		Otu – Oyeneka farmer's multi-purpose cooperative society – Okpai – Obeze	10
Delta South	Isoko South	Unique multi-purpose cooperative society, Oleh	13
		Jaktop multi-purpose cooperative society, Olomoro	12
	Bomadi	Unique multi-purpose cooperative society, Oleh	13

		Jaktop multi-purpose cooperative society, Olomoro	12
Edo			
Edo North	Etsako East	Pointer family support programme multi-purpose cooperative society	6
		Aiseokhuri farmers multi-purpose cooperative society	6
	Etsako West	Enesegbe farmers multi-purpose cooperative society	6
		Itsemhe farmers multi-urpose cooperative society	5
Edo South	Oredo	Helping hand multi-purpose cooperative society	6
		Zion progressive multi-purpose cooperative society	6
	Uhunmwode	Ekhon-Nuwaya multi-purpose cooperative society	6
		Oganisu farmers multi-purpose cooperative society	5
			144

***Source**: Ministry of Agriculture and Natural Resources, Asaba (Delta State) and Benin (Edo State)*

Stage I involved the purposeful selection of Delta and Edo States out of the 6 South-South States of Nigeria.
Stage II had to do with the random selection of two agricultural zones from each of the states, thus making it 4 agricultural zones used for the study.
Stage III involved the random selection of 2 LGAs from each of the agricultural zones. This brought the LGAs used for the study to 8 in number.
Stage IV witnessed the random selection of 2 registered cooperative societies (from the list provided at the LGA offices), thus making it 16 cooperative societies that were used for the study.
Stage V involved the calculation and proportional use of fifty percent (50%) of farmers sampled from each of the randomly sampled cooperative societies. Proportional sampling was done since the groups were made up of unequal membership size and this gave a total of 288 out of which 144 (50%) (comprising of 96 and 48 respondents respectively from Delta And Edo States) was used for the study.

Validation and Data Collection Instrument
Primary and secondary sources were employed in collecting data. Primary data were collected from the cooperative farmers while secondary data were collected from documented sources like textbooks and Journals. Questionnaire and interview schedule were employed in the collection of data from the respondents and these were respectively administered to literate and illiterate farmers. The instruments were administered with the assistance of trained enumerators (who were residents in the respective communities).
The question instruments were subjected to validity and reliability tests. The face content validity method was used to guarantee the instrument's validity while Crombash Alpha technique was used to

ascertain the instrument's reliability. The technique produced a correlation coefficient value of 0.81 which indicated that the instrument was reliable. Okwuokenye and Ovharhe (2017) stated that a correlation coefficient of 0.70 and above indicates that the instrument is reliable.

Data Analytical Techniques

Descriptive and inferential statistics were used to analyze the data of the study. Descriptive statistics involved the use of tables, frequency count, percentage mean and standard deviation. It was used to analyze respondents' socio-economic characteristics and the farmers' level of satisfaction in the groups they belong. Respondents' participation level in activities carried out in cooperative societies was analyzed using a four-point Likert scale. The scale ranged from "Very regular" (coded 4), "Regular" (coded 3), "Sometimes" (coded 2) and "Not regular" (coded 1). The codes produced a mean score of 2.50 and this was obtained as 4 + 3 + 2 + 1 = 10 / 4 = 2.50. The score was used to determine which activity was regularly carried out (mean score ≥ 2.50) and those not regularly carried out (mean score < 2.50). A similar scale was used to ascertain the benefits derived by members from the groups they belong. It was scored as "Strongly Agree" (coded 4), "Agree" (coded 3), Disagree (coded 2) and Strongly Disagree (coded 1). A weighted mean score of 2.50 was obtained. The value of ≥ 2.50 was considered as important in agreeing to the benefits they derived from their groups. While values less than 2.50 were considered otherwise.

On the other hand, inferential statistics was used to analyze the study's hypotheses. These statistics were Binary Logistics regression and Binomial test. They were respectively used to analyze hypothesis one and two. A report on Logistics regression (2017) stressed that Logistics regression is a predictive analysis and it is used to describe data and to explain relationship between one dependent binary variable and one or more nominal, ordinal, interval or ratio-level independent variables. The variables in the model were specified as:

The implicit form of the equation is: $\ln P/(1 - P) = B_o + B_i X_i + e$; Where:
P = Probability of occurrence; 1 – P = Probability of non-occurrence
B_o = the coefficient of the constant term
B_i= the coefficient of the independent variable
X_i= the independent variables
The explicit form of the equation is:
P = benefits derived from cooperative societies (dependent variable: benefits = 1; no benefits = 0)
X_1 = Gender (dummy: male = 1; female = 2)
X_2 = Age (years)
X_3 = Educational level (Pri. educ. = 1; Sec. educ. = 2; Post Sec. educ. = 3)
X_4 = Marital status (single = 1, Married = 2, Divorced = 3, Widow(er) = 4)
X_5 = Farming experience (years)
X_6 = Farm size (ha.)
X_7 = Household size (number of people living and feeding together)
X_8 = Farm income (₦)

Binomial test was used to determine if there was any significant difference between the proportion of farmers that were satisfied and those not satisfied with their cooperative societies. The formula for binomial distribution is given as follows:

$b(x;n,p) = {}_nC_x * p^x * (1-p)^{n-x}$

Where b = binomial probability
x = total number of successes (satisfied or not satisfied)
p = probability of success on an individual trial
n = number of trials

In making a decision, the possible values of the test statistics are divided into two ranges. The critical region of the sample distribution is the area or areas of the sampling distribution of a statistics that will lead to the rejection of the hypothesis tested when that hypothesis is true.

RESULTS AND DISCUSSION

Entries in Table 2 reveals that the respondents patronage of cooperative societies was dominated by males (59.725), most (70.83%) of whom are married, having an average age of 46.22 years, with majority (56.255) of them belonging to the age bracket of 40 – 49 years. This is an indication that they belong to the active age category. The result is line with Okwuokenye (2014) who found average age of farmers in social groups to be 43years.

Most (68.06%) of the respondents had post-secondary educational level, indicating that they were literates and so can be able to manage activities or affairs in the group they belong. This finding corroborates with the results of Jumilu *et al.,* (2014) who submitted that farmers who participate in cooperative societies are usually educated. The modal farming experience was 11.20 years, most (45.14%) of them had between 10 and 14 years farming experience which is an indication that they are experienced in their farming activities. The result of Okwuokenye and Okoh (2018) agreed with this finding. They stressed that farmers in similar groups are always equipped with many years of farming experience.

The average household size was 6 persons with majority (44.44%) of them having 4 – 6 persons as household size. This thus indicates that there are persons that depend on the respondents for economic

livelihood. Ovharhe (2017) results is related to this finding as he identified farmers household size to mostly be around 4 – 6 persons in the Niger Delta region. Majority (53.47%) of the farmers had between 2.1 and 4.0 Ha as their farm size with an average of 2.9 ha. This purports that they are small holder farmers. This result agreed with that of Ovharhe (2019b) who acknowledged that farmers around the Niger Delta area are usually small scale farmers. The farmers average income was ₦282,638.89, with majority (50.69%) of them earning between ₦200,001 – ₦300,000. This implies that farming is really a source of economic livelihood and empowerment to the respondents. Close to this, is the result of Mbagwu (2018) who found cooperators average farm income to be ₦201,000, therefore aligns with this finding.

The dominance of males in the business of cooperative societies may not be unconnected to the tradition of the people which seldom allows women to be involved in activities of social organizations. This result thus agreed with findings of Majurin (2012) which pointed out male dominance in membership in cooperative societies. Since most of the farmers are married, it may be deduced that dividends of participating in cooperative activities is to cater for their families. This result is in line with Okwuokenye and Okoh (2018) who found the dominance of married farmers in similar social organization.

Table 2: Respondents socio-economic characteristics

Characteristics	Frequency	Percentage	Mean/Mode
Gender			
Male	86	59.72	Male
Female	58	40.28	
Age			
20 – 29	9	6.29	
30 – 39	37	25.69	
40 – 49	81	56.25	46.22
50 – 59	20	13.89	
60 – 69	6	4.17	
Educational status			
Primary educ.	3	2.08	
Secondary educ.	43	29.86	
Post Sec. educ.	98	68.06	Post Sec.
Marital status			
Single	25	17.36	
Married	102	70.83	Married
Divorced	11	7.64	
Widow(er)	6	4.17	
Farming exp. (yrs)			
0 – 5	20	13.89	
5 – 9	38	26.39	
10 – 14	65	45.14	11.20
15 – 19	13	9.03	
20 – 25	8	5.56	
Household size			
1 – 3	29	20.14	
4 – 6	64	44.44	5.6
7 – 9	42	29.17	
10 – 12	9	6.25	
Farm size (ha.)			
0 – 1.9	41	28.47	
2.0 – 3.9	77	53.47	2.9
4.0 – 5.9	18	12.50	
6.0 – 7.9	8	5.56	
Income range (₦)			
≤ 100,000	2	1.39	
100,001 – 200,000	21	14.58	
200,001 – 300,000	73	50.69	282,638.89
300,001 – 400,000	30	20.83	
400,001 – 500,000	12	8.33	
≥ 500,001	6	4.17	

Source: *Field survey responses*

Participation in cooperative societies

Records in Table 3 shows level of participation of the cooperators in their groups. It was expressed in the order of magnitude of their mean values. The level was highest or most regular for payment of monthly dues and other necessary contributions (mean = 3.60). This is closely followed by abiding / keeping to the rules of the cooperative society (mean = 3.51), participation in group human capacity development (mean = 3.39). Other regular activities indicating level of participation were regular attendance at meetings (mean = 3.30), extent of contribution to group's discussion (mean = 3.03) and members contribution of personal resources to groups activities (mean = 2.80).

The latter was identified by Damar (2003) as a regular activity thus supports this finding. The other findings are in tandem with the results of Okwuokenye (2014). He identified payment of monthly dues and other necessary charges, abiding by the rules of cooperative societies as well as participation in human capacity development as regular activities carried out by cooperators in their groups. Regular attendance of association's meetings and contribution to group's discussion were identified by results of Eugene (2007) as regular activities indulged in by cooperators, therefore confirms this finding.

Table 3: Level of respondents' participation in cooperative societies

	Delta State		Edo State		Pooled		
Participatory Activities	**Mean**	**SD**	**Mean**	**SD**	**Mean**	**SD**	**Ranking**
Payment of monthly dues, loans and other necessary contributions	3.62*	0.51	3.57*	0.50	3.60*	0.51	1st
Abiding/keeping to the rules of the cooperative societies	3.58*	0.55	3.44*	0.64	3.51*	0.59	2nd
Participation in group's human capacity development	3.15*	0.67	3.62*	0.59	3.39*	0.63	3rd
Regular attendance at meetings	3.41*	0.57	3.19*	0.63	3.30*	0.60	4th
Extent of contribution to the group's discussion	3.15*	0.63	2.90*	0.82	3.03*	0.73	5th
Extent of members contribution of personal resources to group's activities	2.88*	0.75	2.71*	0.62	2.80*	0.69	6th
Extent members have introduced new members to the group	2.33	0.83	2.41	0.82	2.37	0.85	7th

Source: *Field survey responses* *******(Asterisk) Regular (Mean ≥ 2.50)*

Benefits derived by farmers in cooperative societies

The benefits derived by the cooperative society members from their groups are shown in Table 4. The result was presented in the magnitude of their mean values. It however revealed that increased human capacity development in farming (mean = 3.48) had the highest and agreed as the strongest benefit derived by cooperators from participating in groups. The second benefit was improved farm income (mean = 3.46) followed by enhancement of farm output (mean = 3.43) and increased people's rating and self-perception (mean = 3.36). Other benefits were improved standard of living (mean = 3.31), improved farming skills through extension education (mean = 3.12) and created more enlightenment/linkage to

farm input providers (mean = 2.85). Ovharhe (2019c) opined that farmers derived more benefits when the performance rates are very high in set agricultural goal.

Table 4: benefits derived by farmers in cooperative societies

	Delta State		Edo State		Pooled		
Derived Benefits	**Mean**	**SD**	**Mean**	**SD**	**Mean**	**SD**	**Ranking**
Increased human capacity development in farming	3.47*	0.53	3.49*	0.53	3.48*	0.53	1st
Improved farm income	3.47*	0.59	3.45*	0.63	3.46*	0.61	2nd
Enhanced farm outputs	3.38*	0.57	3.48*	0.56	3.43*	0.57	3rd
Increased people's rating and self-perception	3.44*	0.53	3.28*	0.48	3.36*	0.51	4th
Improved standard of living	3.29*	0.46	3.32*	0.48	3.31*	0.47	5th
Improved farming skills through extension education	3.21*	0.55	3.03*	0.67	3.12*	0.61	6th
More enlightenment and linkage to farm input providers	2.64*	0.92	3.06*	0.56	2.85*	0.74	7th
Good relationship of members to one another	2.14	0.93	1.64	0.95	1.89	0.94	8th
Brought one closer to the government of the day	2.32	0.91	1.42	0.95	1.87	0.93	9th

Source: *Field survey responses* *******(Asterisk) Agreed (Mean ≥ 2.50)*

Satisfaction level of members in cooperative societies

The results (Table 5) show revealed that most (59.03%) of the respondents were of high level of satisfaction with their cooperative societies. About 33% and few (8%) were of average and low level of satisfaction. High level of satisfaction may be adduced to the benefits they are deriving from their groups. In agreement with this finding is the result of Tiri *et al.* (2014) and Ovharhe *et al.* (2016) which acknowledged that farmers' level of satisfaction in similar with groups were participation levels are high. The level of satisfaction of with increased farm income which stemmed from enhancement of farm output thereby resulting to improved standard of living, improved farming skills (a sub-set of human capacity development) through extension education as well as linkage to farm inputs providers were agreed in the results of Mbagwu (2018) as benefits derived from participating in cooperative societies, therefore puts it in agreement with the findings of this study. The report of FAO (2009) which confirms the connection of the finding that increased people's rating and perception about the cooperators is a derived benefit stated that, membership of highly rated groups imposes prestige on the members in the eyes of the public.

Table 5: Categorization of respondents' level of satisfaction in cooperative societies

Level of satisfaction categorization	Delta State		Edo State		Pooled	
	Freq	%	Freq.	%	Freq.	%
High	33	68.75	52	54.17	85	59.03
Average	11	22.92	36	37.50	47	32.64
Low	4	8.33	8	8.33	12	8.33
Total	48	100.0	96	100.0	144	100.0

***Source**: Field survey responses*

Hypotheses results

Relationship between farmers' socio-economic characteristics and benefits derived from cooperative societies

The relationship between farmers socio-economic characteristics and the benefits derived from their groups (hypothesis one) was analyzed using Binary Logistics regression analysis (Table 6). The model which was considered appropriate had a Chi-Square value of 56.72 with 8 degree of freedom, while the model's Critical X^2 was 1.96. For this reason it was considered to be significant at the 5% level since. The regression result shows that independent variables like gender, age, education, marital status, farming experience, farm size, household size and farm income jointly accounted for about 67.23% (i.e. R^2 = 67.23%) of the variation of cooperators benefits. Also five (5) variables out of the eight independent variables (namely age, education, farming experience, household size and farm income) were significant to cooperators benefits. Meanwhile, the variables are presented in the magnitude of their beta-coefficient.

Farming experience was positively correlated and significant at the 5% level (b = 1.082; t = 2.684) with respondents derived benefit. This implies that higher farming experience will lead to more benefits derived from their cooperative societies. The result of Okwuokenye and Okoh (2018) agreed with this finding as they noted that the more experience farmers have in farming while participating in social groups, the more benefits they seemed to derive from their farming practice. The odd ratio was 2.483 implying that farmers with high level of farm experience will have about 2.5 times benefits than their counterparts with less experience. Age (b = 0.735; t = 2.416) of the respondents was positively signed with benefits derived from their cooperative societies. By implication, older farmers are bound to reap more benefits than their younger farmers in their groups. This may likely be attributed to the experience gathered in the cooperative business. The result of Yomi-Alfred (2005) confirmed this result. The author submitted that older farmers tend to be more experienced in their groups and with possible impact on

their farm revenue. The odd ratio was 2.763, meaning that older farmers would derive about 2.8 times more benefits than their younger counterparts in their cooperative societies.

The respondents' farm income had a beta coefficient of 0.346 and a t–value of 2.993. The result was positively signed and significant at the 5% level. The positive sign indicates that the higher farmers income are, the more benefits being derived from their groups. This result agreed with that of Ogbonna and Nwaobiala (2018) which stated that higher income of cooperators may result to encountering higher derived benefits. Household size respectively had beta coefficient and t-value of 0.138 and 2.871. The values were positively signed and significantly related to benefits derived from by the cooperators from the social groups they belong. The result suggests that higher farmers' household size would lead to more derived benefits. This may stem from having more persons to use as source of farm labour, which may eventually lead to reduction in cost of production and consequently higher benefits (in form of income). This assertion is in conformity with findings of Nagujja (2003) who acknowledged that large household size may serve as an important source of farm labour supply and enhancement of his productivity. The odd ratio was 2.214 indicating that higher household size will have a benefit that is 2.2 times more than cooperators with small household size.

Education of the farmers had a beta coefficient, t-value and odd ratio of 0.064, 3.327 and 3.102 respectively. The result was positively signed and significantly related to farmers benefits. The positive relationship implies that farmers with higher educational level would reap more benefits than less educated counterparts. Results of Okwuokenye (2014) is at variance with this finding as the author had it that level of education negatively correlates with farming activities and consequently lowering farm income. Result on the odd ratio indicates that more educated cooperators would reap as much as 3.1 times than what less educated cooperators would reap.

Table 6: Relationship between respondents' characteristics and benefits derived from cooperative society's (Binary Logistics regression)

Variables	Coefficient (b)	T	Odd ratio
Farm size	2.535	3.107	2.483
Farming experience	1.082*	2.648	2.385
Gender	0.921	1.733	0.031
Age	0.735*	2.416	2.763
Farm income	0.346*	2.993	3.147
Marital status	0.243	1.942	0.504
Household size	0.138*	2.871	2.214
Education	0.064*	3.327	3.102
Constant	-4.305	-1.874	0.062

Adjusted R^2 = 0.6723; Model X^2 = 56.72; Percentage Correction Prediction = 70.8; Critical t at 5% = 1.96

Test of difference in farmers' level of satisfaction with their cooperative societies

Binomial test was used to analyze hypothesis two which states that: Proportion of farmers satisfied with their cooperative societies was not significantly different from those not satisfied. Table 7 shows the

result of the analysis and it revealed that majority (59%) of the cooperators was assumed to be satisfied with their cooperative societies. On the contrary, the other fraction (41%) claimed to be less satisfied with their group. The result thus implies that farmers' satisfaction with their cooperative group was significantly high. This means that the cooperative groups seemed to be meeting up with their expectations which translate to the benefits being derived by the farmers. Similar result regarding high level of farmers' satisfaction in their groups was obtained by Tiri *et al.,* (2014) and Ovharhe (2017) therefore indicating conformity with this finding.

Table 7: Test of difference in farmers' level of satisfaction with their cooperative societies (Binomial test)

Satisfaction status	Freq.	Proportions
Satisfied	85	59.03 (0.59%)
Less satisfied	59	40.97 (0.40%)
Total	144	100.00 (1.00%)

Source*: Field survey resposes*

Implications

The study revealed how farmers patronized agricultural cooperative societies so as to attain zero hunger in Nigeria. Less youths participated in cooperative business. Thus, there is need to bridge this gap by introducing farming enterprises that will attract youths into farming and consequently cooperative investments.

The existence of small farm sizes implies that farmers need support and expansion of farm enterprises. The average annual low income earning (N282,638.89) calls for financial assistance with inputs/assets subsidies or minimum digital interest loans for farm business enlargement. While areas of higher derived benefits and satisfaction should be sustained, other weak areas should be facilitated in to capacity building activities to elevate farmers' status in the local and global economy thus jointly accomplishing zero hunger.

CONCLUSION AND RECOMMENDATIONS

The result showed that based on high participations, farmers had many benefits and high level of satisfaction from patronizing cooperative societies as a strategy to ensuring zero hunger in the area of study. Their level of patronage in the groups they belonged was quite regular and this practice may not be unconnected to the improved standard of living resulted from cooperative membership.
Based on findings, the study recommends that:

i. there is need to engage in wide spread campaign for new members to come in so that they can join in reaping same benefits individually and thus overcoming the hunger problem nationally and;
ii. some cooperatives derived low benefits from the government. Efforts should be made to bring such cooperatives closer to government so as to have increased benefits in cooperative dividends.

Future Research

The study revealed necessary gaps that need to be researched into. They include:

i. Community Sensitization for Small Farm Holders' Involvement in Cooperative Society Business,
ii. Promoting Cooperative Society Activities through Government Inclusion,
iii. Cooperative Societies as Livelihood Improvement in sub-Saharan: Gender Analysis

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