

Influence of membership of cooperative society on farmers' income in rural areas of Kwara State, Nigeria

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Abstract: Smallholder farmers with small farm sizes, low input utilization, and poor access to effective post-harvest technology are known for low income. These challenges led to the emergence of special programs and social organizations, the most common of which is cooperative society. Yet, little is known about the effect of membership of cooperative society on farmers' income. Hence, this study examined the influence of membership of cooperative society on farmers' income in Kwara State, Nigeria. Primary data collected between February and March, 2015 from 191 household heads were used for this study and were analysed using descriptive and inferential statistics. The results revealed that the mean income of farmers who were members of cooperative society, non-members of cooperative society and control group were ₦15,090±₦3,828, ₦17,686±₦18,306 and ₦11,020±₦2,378 respectively. The results of Kruskal Wallis statistic and the asymptotic significant probability, Jonckheere-Terpstra test for significance of the mean incomes for the various categories of farmers were significant at 1% level. The results of ANOVA test also indicated the existence of significant difference between the means of the income levels of the three categories of farmers at the 1% level. The results of the Post Hoc test for differences/equality among the various categories revealed that the average income of the control category differs greatly from those of the non-cooperative and cooperative groups but there is no significant difference between the mean income of the cooperative farmers and that of the non-cooperative farmers. Thus, membership of cooperative society had positive effect on farmers' income in the study area. Based on this, increasing awareness and information about cooperative societies among farmers in the study area becomes imperative.

Key words: Smallholder farmers, cooperative society, income level, membership, stratification

I. INTRODUCTION

The importance of the agricultural sector in Nigeria economy cannot be overemphasized, as it is the second important economic activity after the oil sector. Corroborating this assertion, National Bureau of Statistics (NBS) (2014) submitted that the means of livelihood of about 70% of the labour force are directly linked to agriculture. According to NBS (2014), the contribution of the sector to the Gross Domestic Product stood at about 40.07% in 2010 and 22% in 2014 (pre and post debasing periods respectively). The sector

provides food for the ever increasing population and foreign exchange earnings as well as income for farmers. Similarly, Anaekwe (2012), reported that the sector is made up of various sub-sectors, namely: crop production, livestock, forestry fishing and processing of agricultural produce (value addition). There is new emphasis by most organizations as well as governments to focus on the whole value addition from production to markets, thereby making agriculture a business. Also, recent studies and research points to the need to add value to agricultural produce thereby creating more jobs and farmers as well could maximize on their benefits in the process (Pravakaret al. 2010).

However, agricultural systems in Nigeria, like most developing nations, are characterized by a number of hindrances which include: technical, financial, institutional and infrastructural supports. These adversely affect the economic wellbeing of farmers. Smallholder farmers with small farm sizes, low input utilization, and poor access to effective post-harvest technology are known for low income. They find it very hard to put their resources together so as to be able to raise their income from farming activities and ultimately enhance their standard of living. Due to low financial capacity, it is very difficult for these individual farmers to embark on large-scale production. It therefore becomes necessary for farmers to come together as a group and pool their resources together so as to be able to benefit tremendously from collective advantage, thereby resulting into increase in their income and broadening of the industrial base of the economy (Epetimehin 2006). The numerous challenges facing agricultural development in the country led to the emergence of special programs and social organizations. The most famous among the social organizations are cooperative societies.

A cooperative society is made up of group of persons who have willingly come together for the purpose of achieving a common goal through the formation of a formal organization by contributing certain amount of money to the capital base and sharing in the risks and benefits of the organization (World Bank 1989). Cooperative can be defined as a self-governing organization of individuals who willingly come

together to satisfy their mutual cultural, economic and social desires by means of a cooperatively owned and constitutionally structured ventures (International Cooperative Alliance 2010). Cooperative society is established to satisfy people's mutual yearnings, and has its root in the idea that collectively, a group of persons can accomplish a goal that may be difficult for individuals to accomplish alone.

Cooperative organizations remains the best veritable tool through which the small scale farmers in Nigeria can be helped (Bello 2005). It is one of the most effective vehicles for efficient mobilization of production resources and acceleration of rural development. It plays a significant role in agricultural development through training of members, provision of: inputs and storage facilities, value addition services as well as marketing of agricultural produce (Odetola et al. 2015). Overall, cooperative society is useful in driving productivity, lowering poverty and food insecurity as well as reducing unemployment (United Nations General Assembly 2015; International Labour Organization (ILO) 2017). As a driver of productivity, it serves as an avenue through which farmers can raise their incomes. However, despite the many benefits of membership of cooperative societies, not everyone belongs to one. This is because of difference in individual perceptions about the organization (Abate 2018). According to Zheng et al. (2012); Frank et al. (2015) and Kumar et al. (2015), the varying perceptions could be influenced by sex, age, level of education, operational costs, and terms and conditions.

Evidences have shown that agricultural cooperative societies have both advantages and disadvantages on smallholder farmers' performance. According to Ito et al. (2012), membership of a cooperative society impacted positively on the income of watermelon farmers in China. Dairy farmers in India who were members of cooperative societies were more efficient and have higher profits than their non-cooperator counterparts (Vandeplas et al. 2013). Holloway et al. (2000) opined that membership of cooperative society and market participation among dairy farmers in Ethiopia were positively related. Fisher and Qaim (2012a) reported that in Kenya, membership of cooperative society had positive effect on farm income of banana farmers. Also, Verhofstadt and Maertens (2014) investigated the impact of cooperative membership on the income of farmers in Rwanda and showed that cooperative improves the income of respondents. Notwithstanding its positive influence on farmers' income, Hellin et al. (2009) revealed that maize farmers who were members of cooperative societies compared with those that were not members, were not successful. This was because the cost of being members of the society was higher than an increased income realized from sales of maize. To the best of authors' knowledge, little or nothing is known about the influence of membership of cooperative societies on the income level of smallholder farmers in the study area. Hence, the main objective of this study is to examine the influence of membership of cooperative society on income of smallholder farmers in Kwara State, Nigeria. The study therefore

hypothesized that membership of cooperative society will not have any significant effect on members' income.

II. MATERIAL AND METHODS

The research was conducted in Kwara State, Nigeria. A multi-stage sampling techniques was employed in choosing the respondents. At the first stage, two LGAs: Irepodun and Oke-Ero Local Government Areas (LGAs) were purposively selected out of the sixteen (LGAs) the state is divided into. While all the areas of agricultural enterprises in the state were covered by farmers in the two selected LGAs, Irepodun LGA has a fair number of farmers belonging to cooperative society (65.6%), OkeEro had the least (45.6%) (Kwara State ministry of Agriculture 2010). Agricultural extension officers at the headquarters of the selected LGAs assisted in compiling the list of villages in their areas. The stage that follows was a random selection of 15 out of 40 (37.5%) villages with high concentration of households whose members belonged to at least one cooperative society from Irepodun LGA and purposive selection of the only 2 villages from Oke-Ero LGA where there is no record of farmers who are cooperative members. Compilation of the list of the households in the selected villages was performed by the enumerators with the assistance of the village heads under the supervision of the researcher. The third stage was the stratification of the list of the households from Irepodun into two strata, i.e cooperators and non-cooperators. Any household with at least a member that belongs to one cooperative society belonged to the stratum cooperators, and non-cooperators stratum if otherwise. The fourth and final stage was a random selection of 180 of the 225 (80%) from cooperators and 152 of 190 (80%) from non-cooperators from the selected villages for Irepodun LGA. At this stage also, there was random selection of 38 of the 48 (80%) control group from the villages selected in Oke-Ero LGA which had never had a cooperative established in the community. Finding the control group pose a lot of challenges, as it was difficult to find villages whose inhabitants specialize in all the agricultural enterprises like the cooperators and non-cooperators and yet has similar condition with them. We had no choice than to study the control group in the absence of baseline data.

Validated, well-structured, pre-tested questionnaires were used to gather cross-sectional data from respondents. Information gathered from respondents include their socio-economic characteristics, farm size cultivated and farming experience, other means of livelihood, and participation in entrepreneurial training among others. However, given the focus of the study and the need for cooperators and non-cooperators with similar characteristics, we dropped respondents who belonged to other associations among the cooperators, non-cooperators and control group. Based on this, we assumed homogeneity of the data from the three categories of respondents. In all, 85, 76 and 30 questionnaires for cooperators, non-cooperators and control group respectively were found usable for the purpose of this

research. The data collected were analysed using descriptive and inferential statistics.

III. RESULTS

Demographic characteristics of respondents

The descriptive statistics of cooperators, non-cooperators and control group are presented in Table 1. As indicated in the table, the mean age of the cooperators and non-cooperators stood at about 48 years, while those of control category was about 47 years. Our findings on the sex of the respondents (mainly household heads) show that over 70% of the respondents were males. The years of schooling among the cooperators, non-cooperators and control category were about 7, 6 and 5 respectively. This implies that variation exists in the years of schooling of respondents, with the cooperators having the highest and the control group having the least. This may be because the better educated respondents new the importance of joining cooperative society in the study area. This may have effect on participation of farmers in cooperative societies. Cooperators had fewer household members (about 5) compared to non-cooperators and control group of about 6 members. Cooperators, non-cooperators and control group had been farming for the past 24 years and 22 years respectively. The cooperators, non-cooperators and control group cultivated 4.82 acres, 4.85 acres and 4.89 acres of land respectively. About 91% of cooperators, 63% of non-cooperators and 57% of control category had other means of livelihood which shows that more cooperators had other means of livelihood compare to others. Nearly 86%, 18% and 17% of cooperators, non-cooperators and control group respectively had received entrepreneurial training at least in the last one year before the survey.

Table 1: Demographic characteristics of the three categories of respondents (continuous and categorical variables)

	Cooperators (n = 85)		Non-cooperators (n = 76)		Control Category (n = 30)	
Continuous variables						
Mean	S. Dev.	Mean	S. Dev.	Mean	S. Dev.	
Age	48.29 4	11.908	48.431	11.30 9	46.76 7	11.24 2
Level of education	7.094	5.943	6.039	5.702	5.100	5.175
Household size	5.353	1.950	5.667	1.881	6.447	2.505
Farm size	4.188	1.735	4.855	1.485	4.893	1.783
Farming experience	24.17 6	13.114	24.013	12.03 2	21.86 6	11.32 2
Categorical variables						
	Freq.	Percent t Freq.	Percent t	Freq.	Percent	
Sex: Male Female	60 70.6 1529.4		5876.3 823.7		2480.0 620.0	
Other means of livelihood: Yes No	7790.6 99.4		4863.2 2836.8		1756.8 1343.2	

Entrepreneurial training:			
Yes	73	85.9	1418.4
No	12	14.1	6281.6
			516.7
			2583.3

Source: Research Data, 2015

Descriptive statistics of income levels of respondents

The results of income levels of respondents are presented in Table 2. The results indicate that the total monthly income of the 85 sampled cooperators was ₦1,282,700. The minimum income earned by farmers in this category was ₦7,900, while the maximum income was ₦172,300. Furthermore, their mean income level stood at ₦15,090 with a standard deviation of ₦3,828. The distribution of incomes is negatively skewed as revealed by the coefficient of Skewness (-0.072) and the coefficient of Kurtosis (-0.528), thus showing that the excess Kurtosis is -3.528. This implies that the distribution of income is platykurtic (flatly peaked and lightly tailed).

Also, the results show that the total monthly income of the 76 sampled non-cooperative farmers was ₦1,344,107. The minimum income earned by farmers in this category stood at ₦8,200, while the maximum monthly income was ₦172,300. Furthermore, their mean income level stood at ₦17,686 with a standard deviation of ₦2377.88. The distribution of incomes is positively skewed as revealed by the coefficient of Skewness (8.234) and the coefficient of Kurtosis (70.38), showing that the excess Kurtosis is 67.528. This implies that the distribution of income is Leptokurtic (highly peaked and heavily tailed).

Furthermore, the analysis indicates that the total monthly income of the 30 sampled respondents in the control group stood at ₦191,503. The minimum income earned by farmers in this category was ₦1,305, while the maximum income was ₦11,020. Furthermore, the average income level of the control category was ₦6383.40 with a standard deviation of ₦2377.88. The distribution of income is negatively skewed as revealed by the coefficient of Skewness (-0.153) and the coefficient of Kurtosis (-0.226), showing that the excess Kurtosis is -3.336. This implies that the distribution of income is Platykurtic (lowly peaked and lightly tailed).

Table 2: Descriptive statistics of income levels of respondents (1 USD = ₦311.93 as at the survey time)

Category	Min	Max	Sum	Mean	Std Dev	Skewness		Kurtosis	
	Stat	Stat	Stat	Stat	Stat	Stat	Std Err	Stat	Std Err
Cooperators	7900	25000	1282700	15090	3828	-0.072	0.261	-0.528	0.517
Non-cooperators	8200	172300	1344107	17686	18306.4	8.234	0.208	70.38	0.545
Control group	1305	11020	191503	6383.4	2377.88	-0.153	0.427	-0.226	0.833

Source: Research Data Analysis, 2015

Test for significance of the mean incomes for the various categories of respondents

Tables 3a, 3b and 3c present the results of the test for significance of the average incomes for the various categories of farmers. The results show that there is a significant difference between the means of the three categories of farmers at the 1% level since the asymptotic significant probability associated with the Chi Square test for significance of the Kruskal Wallis statistic and the asymptotic significant probability Jonckheere Terpstra were 0.000, less than 1%.

Table 3a: Kruskal Wallis Test

Category of Farmers	Mean Rank
Cooperators	106.56
Non-cooperators	114.78
Control Group	18.52
Total	

Source: Research Data Analysis, 2015

Table 3b: Test Statistics

Parameters	Statistics
Chi square	70.855
df.	2.00
Asymp. sig	0.000

Note: a = Kruskal Wallis Test

b = Grouping variable

Source: Research Data Analysis, 2015

Table 3c: Jonckheere Terpstra Test

Number of Income levels (N) = 3	
Observed J-T Statistic	191
Observed J-T Statistic	3635.50
Mean J-T Statistic	5645.00
Standard Deviation of J-T Statistic	405.25
Standard J-T Statistic	-4.957
Asymptotic Sig. (2-tailed)	0.000

Source: Research Data Analysis, 2015

The results of ANOVA test on the comparison of the income levels of the three categories of farmers

The results of the ANOVA test on the comparison of the three income levels is presented in Table 4. The results show that there is a significant difference between the means of the three categories of farmers at the 1% level since the asymptotic significant probability associated with the F test is 0.000, which is less than 1%. The implication of the results is that the incomes of the three categories of farmers (cooperators, non-cooperators and control category) are not the same.

Table 4: ANOVA result

	Sum of Squares	df	Mean Square	F	Sig
Between Groups	2764794299	2	1382397150	9.796	0.000
Within Groups	26529013840	188	1411117757		
Total	29293808139	190			

Source: Research Data Analysis, 2015

Multiple regression test

The outcomes in Tables 4 and 5 necessitated the conduct of a multiple comparison test to determine where the differences lie. The results of the Post Hoc test for differences/equality among the various categories of respondents are presented in Table 5. The results indicate that the average income of the control category is significantly different from those of the non-cooperators and cooperators, but no significant difference exists between the average of the cooperators and that of the non-cooperators.

Table 5: Post Hoc Tests: Homogeneous subsets

Category of Farmers	Subset for $\alpha = 0.05$	
	1	2
Control Group	6383.433	
Cooperators		15090.588
Non-Cooperators		17685.618
Significance	1.000	0.269

Source: Research Data Analysis, 2015

IV. DISCUSSION AND CONCLUSION

The mean ages of the cooperators and non-cooperators which were similar are a bit higher than that of the control category. This implies that the respondents were relatively young, economically productive and are expected to still have strength to participate actively in associations as opined by (ILO 2006). The findings agree with the submission of Ma and Abdulai (2016) who opined that differences exist in the age of cooperators and non-cooperators and that of Mojo et al. (2017) who reported that cooperators were older than non-cooperators.

Our findings on the sex of the respondents show that majority of the households sampled were headed by males. Adeyonu et al. (2019) and Obaniyi et al. (2020) also reported that the majority of the farming households in the study area were headed by males. The cooperators were relatively more educated than the non-cooperators who were in turn more educated than the control group. Perhaps, the relatively high level of education reported among the cooperators is not unexpected as educated farmers are likely going to join cooperatives (Mojo et al. 2017). This is however a confirmation of low level of education among farmers in the study area as revealed by (Kwara State ministry of Agriculture 2010). Cooperators had fewer household members compared with non-cooperators and control group. The household sizes of the three categories of respondents are higher than the recommended national size of 4. Cooperators and non-cooperators who had similar years of farming experience are more experienced than the control group. Differences occurred among the size of the farm land cultivated by the three categories of respondents. While the control group cultivated the highest farm land, cooperators cultivated the least. Our findings compare well with the submission of Mojo et al. (2017) who also revealed that these variables differed among cooperators and non-cooperators.

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While well over 80% of the cooperators had other means of livelihood and had attended entrepreneurial training, about one year before the survey, the proportion of the non-cooperators and control group are well below 20%. This is not surprising as cooperative societies are known for training of their members and this may also be responsible for the involvement of more cooperators in other income earning activities aside farming. Our findings agree with the submission of Gebremichael (2014) who opined that cooperative membership helps household to diversify their livelihoods.

Furthermore, the mean income of the non-cooperators is slightly higher than that of the cooperators, although the difference is not significant. This may not be unconnected with the fact that the non-cooperators are immediate neighbours of the cooperators and might therefore have benefited from spill-over effects of cooperators without financial commitment to the cooperative society. As indicated by Bontems and Fulton (2009) and Fulton and Giannakas(2001), membership of cooperative society has a cost. Similar results were obtained by Toluwalase and Apata (2013), but in sharp contrast to the submission of Calkins and Ngo (2005) who reported that cooperators had higher income than non-cooperators and control group. However, the descriptive statistics showed that the standard deviation of the cooperators' income was ₦3827.86, while that of the non-cooperators was ₦17685.62, thus indicating a higher dispersion of the non-cooperators' income. This means that the distribution of the income of the non-cooperators was more dispersed from the mean and thus has more extreme values than the distribution of the income of the cooperators.

Hence, on the average, the cooperators are better off than the non-cooperators, although the highest non-cooperator earners are richer than the highest cooperator earners (Getnet et al. 2018; Sibuea and Sibuea 2018; Hoken and Su 2018). The control group which has no linkage with cooperative societies, had a significantly lower income than the farmers who are members of cooperative society. This is an indication that agricultural cooperative societies have significantly impacted on the income of smallholder farmers in Kwara state. The findings concur with the submission of Pitts (2018); Abate (2018); Verhofstadt and Maertens (2014), who showed that the income of cooperators was higher than the non-cooperators on the average.

On the average, the cooperators were better off than the non-cooperators and control group. The study shows that membership of cooperative society significantly influenced the income of farmers in Kwara state. Increasing awareness and information about cooperative societies among farmers in the study area will go a long way to improve their level of incomes and by extension, standard of living.

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