
Effects of Social Capital on Adoption of Improved Technology and Productivity of Cassava Among Farmers Cooperative Societies in Osun State

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Abstract: This study investigated the effects of the social capital on the adoption of improved technology, profitability and productivity among cassava farmers in Osun state. A Multistage sampling procedure was used to obtain information from 100 cassava farmers and the data collected were analyzed using descriptive statistics, tobit, budgetary analysis and stochastic production function models. Results from the study showed an average cassava farmer was young, very active and smallholder in nature. Cassava farmers who participated in social capital network benefitted tremendously from their group because they made more profit and were more efficient than those who did not participate in any social network. The study concluded that cassava farmers who participated in social capital networks were more efficient than those who did not participate in any social network. The study therefore recommended that cassava farmers in the study area should be encouraged to participate in social capital networks in order to improve their profit level and productivity. Also in order to promote and facilitate the rate and intensity of adoption of improved technologies among farmers, social capital and group networks should be considered as appropriate channels to introduce and train farmers for maximum impact.

Keywords: Social Capital, Adoption, Improved Technology, Farmers' Cooperatives, Productivity and Profitability

1. Introduction

Cassava is grown throughout the tropic and could be regarded as the most important root crop, in terms of area cultivated and total production [1]. Nigeria is the largest producer of cassava in the world with about 150 million metric tonnes and the country cassava transformation agenda is the most advanced in Africa [2]. The biochemistry of the crop has proved that the protein in the leaves is much and that the leaves serve as source of protein for both human beings and livestock and can provide balanced diet protecting millions of African children against malnutrition. Cassava can be eaten as fufu, garri, tapioca. It can also be eaten raw, roasted or fried, boiled, and in many other forms. Cassava serves as raw material when processed into flour. It serves as raw material for bakery industries, starch for textile industries, adhesive glucose for pharmaceutical industries and ethanol for brewery and bottling industries [3].

Over the years, the mean yield of cassava produced in

Nigeria had increased substantially [3]. However, the current level of production has not been able to meet the demand by growing population in the country. Studies [4, 5] have shown that one of the ways through which farmers could improve their productivity is by coming together as groups and social networks to pull their limited resources together and adopt improved farm practices and innovations. These groups and local associations (such as cooperatives) could help farmers to generate social capital which could provide individuals and groups with access to productive resources [6-9]. Such interactions and social networks sometimes could increase information flows, reduce transaction costs, and create a platform for skills acquisition and enhancement [9-11]. Thus, social relationships and networks could affect the economic sustainability of farmers by influencing farming practices and their propensity to adopt newer technology via the supply of

information through these networks [12]. Despite the potential roles of social capital networks in helping the farmers to adopt new technologies, little or no attention has been given to the actual effect of social capital on technology adoption [13]. Participation in social capital networks and cooperatives has great impact on the decision of farmers by providing access to information. This consequently influences the adoption decision especially among cassava farmers. The foregoing thereby raised the following research questions; what were different forms of social capital networks available in the study area? What was the rate and intensity of adoption of improved technology in cassava production? Were there differences in the profitability and productivity among cassava farmers who belonged to cooperative societies or other social capital networks? This study attempted to provide answers to these questions.

2. Methodology

2.1. Area of Study

This study was carried out in Osun State; one of the south-western states in Nigeria. With a total land mass of 9,251 km² (3,571.8sq mile), and bounded in west by Oyo state. According to the 2016 population census, the state has a population of 4,137,627 and 30 local government areas (LGAs). More than 75% of the state inhabitants are farmers who produce food crops such as maize, yam, and cassava. Cassava is a major crop in the state. It is usually grown as a sole or mixed crop in all the LGA of the state. The predominant soil in the area is deep well drained sandy loam while the vegetation is tropical forest. Farmers in the state are members of different local associations and cooperative organizations.

2.2. Sampling Technique

The study area has six administrative zones. These are Ife, Ilesa, Iwo, Ede, Osogbo and Ikirun zones. A multi-stage sampling procedure was used to select the respondent. At the first stage, two administrative zones were randomly selected and these were Ilesa, and Iwo zone. At the second stage one local government area (LGA) was randomly selected from each of the chosen administrative zone making a total of 2 LGAs. Cassava farmers in the study area were stratified based on whether they belonged to cooperative and social networks or not at the third stage. At stage four, a total of 5 cooperative societies were randomly selected from the chosen local government area based on the list of registered associations provided. The fifth stage involved random selection of 5 cassava farmers from each farmers' cooperative/social networks to make a total of 50 respondents, while 50 cassava farmers who were not members of any cooperative/social networks were randomly selected (proportionate to size) from the list of registered cassava farmers in the two LGAs. In all, a total of 100 respondents were selected for this study.

2.3. Analytical Techniques

2.3.1. Descriptive Statistics

Descriptive analysis such as frequency distribution, mean, percentage and range was used to describe the socio-economic characteristics of the respondent in the study area.

2.3.2. Budgetary Analysis

The budgetary analysis was used to determine the profitability of each cassava farmers of the study area. The evaluation of the cost and returns associated with cassava production was done using costs and returns to production. This technique comprises of two main concepts which are Gross margin and Net return.

The budgetary analysis was calculated by using the formulas below:

$$GM_i = TR_i - TVC_i \quad (1)$$

$$\text{Net Profit}_i = GM_i - TFC_i \quad (2)$$

$$\text{Net Profit}_i = TR_i - (TFC + TVC)_i \quad (3)$$

$$\text{Return per naira invested} = GM_i / TC_i \quad (4)$$

Where, $TC_i = TFC_i + TVC_i$

GM = Gross margin, TR = Total Revenue, TC = Total Cost, TFC = Total fixed cost, TVC = Total variable cost, Π = Profit on cassava production.

2.3.3. Tobit Regression Analysis

The tobit regression analysis was used to analyze the level of adoption of improved technology by the respondent in the study area.

The model is explicitly expressed as;

$$I = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 \dots \dots \beta_{11} X_{11} = f(X_i) \text{ and } y = \delta f \quad (5)$$

Where $y = 0$ if $I < I^*$

$y = 1$ if $I \geq I^*$

$y = \beta_1 X_i + \mu_1$

I = Adoption index

Y = level of technology adoption, (dummy variable, 1 = adopted, 0 = otherwise); β_0 = constant, β = coefficient and U_i = error term

The explanatory variables are:

X_1 = age of the respondent (years); X_2 = gender (1 = male, 0 = female); X_3 = level of education (years); X_4 = farm size (ha); X_5 = farming experience (years); X_6 = household size (#); X_7 = Extension visit (yes or no); X_8 = access to credit (yes or no); X_9 = primary occupation (1 = full-time farmer, 0 = part-time farmer).

2.3.4. Stochastic Production Frontier Model

The stochastic frontier production function model is specified in the implicit form as follows:

$$Y_i = f(X_i, \beta) + (V_i - U_i) \quad (6)$$

Where: Y_i is the output of the i th farm, X_i is a $k \times 1$ vector

of input quantities of the *i*th farm, β is a vector of unknown parameters to be estimated, V_i are random error which and independent of the U_i , U_i are non-negative random variables, called inefficiency effect.

A Cobb-Dougllass Production form of the frontier used for this study is presented as follows. This is specified to estimate the production efficiency in cassava production as:

$$\ln Y = \beta_0 + \beta_1 \ln X_1 + \beta_2 \ln X_2 + \beta_3 \ln X_3 + \beta_4 \ln X_4 - V_i - U_i \quad (7)$$

Where; Y = Total output of cassava produced (kg); X_1 = Farm size (hectares); X_2 = No of labour used (manday); X_3 = Cost incurred on planting (₦); X_4 = Cost incurred on weeding (₦).

β_0 = constant, β_1 to β_4 are coefficients to be estimated and V_i and U_i are error terms.

The inefficiency model was jointly used with the stochastic frontier model in other to determine the factor affecting efficiency stated in equation (7) below as:

$$U_i = a_0 + a_1 Z_1 + a_2 Z_2 + a_3 Z_3 + a_4 Z_4 + a_5 Z_5 + a_6 Z_6 \quad (8)$$

Where: U_i = inefficiency, a_0 = Constant, $a_1 - a_6$ = parameters to be estimated

Z_1 = Year of experience (years); Z_2 = Household size (#); Z_3 = Age of farmers (years); Z_4 = Education level (years); Z_5 = Credit access (yes=1 no= 0); Z_6 = gender of farmer (male = 1 female = 0)

3. Results and Discussion

3.1. Socio-economic Characteristics of Respondents

The socio economics characteristics of the respondents were presented in Table 1. The average age of cassava farmers belonging to social networks was 54.8 years while the average age of the farmers who did not belong to any social networks was 48.38 years. This implied that cassava farmers in the study area were young and very active. This finding agreed with the report of Okorie [14]. About 62% of the farmers who were members of social networks were married, while 80% of those who were not members of social network were married. Majority (76.0%) of the respondents in the study area were males. This implied that cassava production was male dominated. Majority of the respondents were educated enough to enable them successfully adopt innovations and improve their productivity. Hence, they were expected to be receptive to new innovations. The average farm size among the cassava farmers in the study area was between 1.50 to 1.57 ha. This implied that cassava farmers in the study were smallholder farmers. The average number of farmers' experience was 19 years. This has a strong indication on their ability to make decision regarding their farm operations. On the average, the household in the study area had about 7 members. This implied that cassava farmers in the study area could have access to family labour.

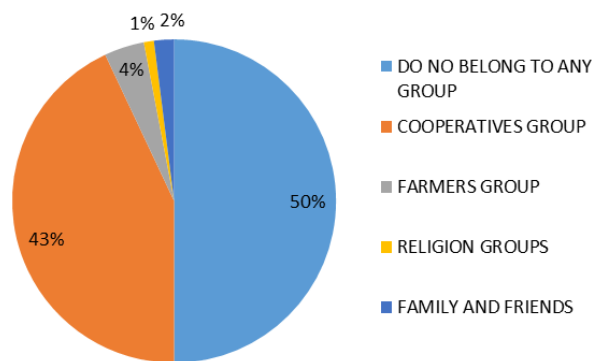
Table 1. Socio economic characteristics of cassava farmers.

Socioeconomic Variables	Members of Social Network	Non-member of Social Network
Male (%)	82	70
Age (years)	48.38	54.88
Married (%)	80	62
Household size (#)	5.63	4.3
Farm size (ha)	1.57	1.50
Farming experience (years)	18.50	22.45
Formal education (%)	92	88

Source: field survey, 2017.

3.2. Various Forms of Social Capital Networks

The distribution according to the various social networks available in the study area is presented in Figure 1 below. The result showed that about 50% of respondents did not belong to any group or association, while 43% of the respondents belonged to various cooperatives, 4% belonged to farmers' group, 1% was in religion group and 2% other social groups.



Source: Field survey, 2017.

Figure 1. Distribution of various form of Social capital among respondents.

3.3. Benefit Received by Members from the Social Networks

The distribution according to the benefit derived from their social networks (Table 2) indicated that 82% of the cassava farmers that were members of social network said that they had improved access to credit. About 66% of these farmers indicated that they were able to improve the sale of the output through their association. Over 90% of these farmers said that they have had to make useful adoption decision based what they have learnt being a member of the social group. This implied that membership of social network facilitate adoption decision in the study area. This finding is consistent with many literatures on adoption decision and membership of association. However only 8% of cassava farmers said that membership of such networks have provided external linkage to them. This implied that the nature of social networks in the study area is local with external influence. Result further showed that 565 percent of these farmers have benefitted from their respective social networks in terms of access to farm inputs. This could also help to facilitate their adoption decision in the area.

Table 2. Benefits received from the associations.

Variables	Frequency	Percentage
Access to credit	41	82
Improved sales of farm produce	33	66
Useful information from association	38	76
Link with external organization	4	8
Learn about new innovation from the association	47	94
Receive farm inputs	28	56

Source: Field survey, 2017.

3.4. Rate and Intensity of Adoption of Improved Technology

The rate of adoption among the cassava farmers is presented in Table 3 below. The result revealed that 73% of respondents adopted the use of improved varieties, 24% applied fertilizer as an improved technology, 45% adopted standard planting spacing for their crops, and 12% used irrigation, while 37% adopted other technologies such as the herbicide, pesticides, among others. The result implied that the rate of adoption varied by individual and according to the technology in question.

Table 3. Percent rate of adoption of each of improved technology of respondents.

Technology	Rate of adoption
Improved stem	73
Fertilizer	24
Spacing	45
Drying	-
Irrigation	12
Planting	85
Others	37

Source: Field survey, 2017

The intensity of adoption of technology among the cassava farmers is presented in Table 4 below. The result further revealed among cassava farmers who were member of social networks 80% were full adopters of improved technology, 20% were partial adopters while none of them was in the category of low adopters. However, among cassava farmers who were not members of any social network, the result was different. As 50% of the latter groups were full adopters of the various improved technologies, 30% were partial adopters while 20% were low adopters. This result

indicated that farmers who were members of social networks adopted innovation more than their counterparts who were not members of any social group. This confirmed the findings by Nsoanya [15] on intensity and rate of adoption of improve technologies among farmers.

Table 4. Distribution of rate and intensity of adoption of improved technology by respondents.

Rate & intensity of adoption	Respondents that belonged to networks		Respondents that did not belong any network	
	Frequency	Percent	Frequency	Percent
Less Adopter	0	0.0	10	20.0
Partial Adopters	10	20.0	15	30.0
Full Adopters	40	80.0	25	50.0
Total	50	100.0	50	100.0

Source: Field survey, 2017

3.5. Factors Affecting Intensity of Adoption of Improved Technology

The results of the Tobit regression model (Table 5) showed that out of the factors suspected to have influenced the intensity of adoption among cassava farmers in the study area, gender, years of education, household size and membership of social networks showed significant influence of the intensity of adoption of various technology among cassava famers at vary level of confidence interval. The level of confidence interval indicated were household size (5%) and gender, education level, and membership of social networks being significant at 10%. There was a negative but significant relationship between adoption and household size. This implied that an increase in household size may lead to a decrease in the rate of adoption of improved technology. The positive significance by gender implied that the male-headed household had a higher probability of adopting improved technology than female-headed household. This finding suggested that female farmers had low rate of adoption compared to male. There was also a positive relationship between adoption of improved technology and membership of social networks in the study area. This implied that intensity adoption by a farmer would increase when such farmer joined a social network in the study area. This result confirmed the findings of Beshir [16] and Awotide [17].

Table 5. Determination of the rate and intensity of adoption of improved technology.

Adopter Index	Coefficient	Std. Err.	t-value	P> t
Age	.0032	.00478	0.69	0.493
Gender	.225	.11798	1.91**	0.059
Education	.1127	.06484	1.74**	0.085
Pry. Occupation	.0320	.07068	0.45	0.651
Farm exp.	-.00149	.00558	-0.27	0.790
Cultivated (ha)	.0594	.08441	0.70	0.483
HH. size	-.0522	.02302	-2.27*	0.026
Ext. visit	-.0689	.06010	-1.15	0.254
Membership of social networks	.2280	.11976	1.90 **	0.060
Constant	-.520	.30833	-1.69 **	0.095
Sigma	.331	.05576		
LR chi ² (10)	13.85			
Prob> Chi ²	0.0012			

Adopter Index	Coefficient	Std. Err.	t-value	P> t
Pseudo R ²	0.1553			
Log likelihood	-37.642948			

Source: Field survey, 2017 *, ** represents 5% and 10% significant level respectively

3.6. Profitability of Cassava Production in the Study Area

The result of the profitability of the cassava business in the study area is presented in Table 5 below. The analysis of that the various cost incurred and revenue generated showed that cassava farmers who belonged to social networks made more revenue (₦144,420.00) from the sales of output as compared with cassava farmers (₦122,720.00) who did not belong to any social network. The fact that those farmers who were members of different networks in the area had average output (23,180 ton/ha) lower than those who did not belong in any group (37,060 ton/ha), they still made more revenue. This implied that the cassava farmers who were members of social networks were able to sell their produce at better price compared to their counterparts who were not in any network. Gross margin result also showed cassava

farmers who belonged to networks made an average gross margin (₦74,008.00) on their investment that was 30% higher than what an average farmer who did not belong in any network made (₦56,874.00) during the production year under consideration. The total cost which is an indication of overhead cost also indicated that an average farmer who was a member social group made more investment (₦104,240.00) than their counterpart who were not a member of any group (₦85,580.00). This was probably due to the fact that the former group of farmers had more access to credit compared to the latter. Although the observable different was not statistically different, the net profit also indicated that cassava farmers who were members of the social networks were better off (₦40,180.00) than those who were not member of any group (₦37,140.00).

Table 6. Comparing the profitability between respondent who belong to group and those that does not belong to any group.

Items	Respondents that did not belong any network	Respondents that belonged to networks	All respondents	t-test
Total Revenue (TR)	122,720	144,420	267,140	2.183*
Total output (ton/ha)	37,060	23,180	30,120	
Variable costs				
Planting & Stem cost	31,800	35,900	67,700	0.803
Weeding cost	17,626	20,866	38,482	1.661**
Harvesting and other costs	16,420	13,646	30,066	2.246*
Total Variable Cost (TVC)	65,846	70,412	136,262	0.723
Gross Margin (TR-TVC)	56,874	74,008	130,882	1.938**
Fixed cost				
Rent	2,999	4,303	7,302	
Depreciation	16,735	29,525	46,260	
Total Fixed Cost	19,734	33,828	53,562	2.150*
Total Cost (TC)	85,580	104,240	189,820	2.268*
Net Profit (TR - TC)	37,140	40,180	77,320	0.615

Source: Field survey, 2017 *, ** represents 5% and 10% significant level respectively

3.7. Productivity of Cassava Farmers in the Study Area

The results of the stochastic frontier production function estimation as obtained from Frontier 4.1 software is presented in Table 7 below. The variance parameters of the stochastic frontier production function were represented by sigma squared (σ^2) and gamma (γ). The sigma squared was positive and significantly different at five percent level. The mean technical efficiency among farmers who belonged to social networks indicated that they were more efficient 94.8% than cassava farmers who did not belong to any social network 53.1%. This result implied that those farmers who were members of the group networks were operating very close to the frontier and their level of inefficiency was 5.2% as compared with 42.9% inefficiency level observed among farmers who were not members of any group network. The result further showed that access to credit contributed significantly to the level of efficiency observed among cassava farmers who were members of social networks. This was due to the fact that this group of farmers had access to more credit

and as such they could adopt technologies that could help them to optimize the use of their resources and hence they were more efficient than the other farmers who did not have such access to credit. Apart from the level of education, other factors that influenced the level of efficiency among cassava farmers who were members of social networks include level of education and household size. However the result indicated that both the level of education and household size were negatively related to the level of efficiency. This finding is contrary to some of the literature on efficiency. This was probably due to the fact that the highly educated cassava farmers in the study area devoted little time to their farming business as most of them were part-time cassava farmers and were busy with their full-time work. All the inefficiency factors that were considered were found to significantly affect the level of efficiency among cassava farmers who were not members of any group in the study area. Some of the factors include, age of the respondents, level of education, years of experience, household size and the gender status of the respondents. The result clearly showed that cassava farmers

who were members of social capital networks were more efficient than those who did not participate in any social network in the study area.

4. Conclusion

This study investigated the effect of social capital on the adoption of improved technology, profitability and productivity of cassava farmers in Osun state, Nigeria. The study concluded that an average cassava farmer in the study area was young, very active and smallholder in nature. Cassava farmers who participated in social capital network benefitted tremendously from their group in terms of access to credit, market information, input supply, and improve awareness on different innovation. These benefit aided their decision to adopt more technologies than their counterpart

who did not participate in any group network. The study also showed that cassava business was generally profitable in the study. However, cassava farmers who participated in social capital networks made more profit than those who did not participate in any group network. The study further concluded that cassava farmers who participated in social capital networks were more efficient than those who did not participate in any social network in the study area. The study therefore recommended that cassava farmers in the study area should be encouraged to participate in social capital networks in order to improve their profit level and productivity. Also in order to promote and facilitate the rate and intensity of adoption of improved technologies among farmers, social capital and group networks should be considered as appropriate channels to introduce and train farmers for maximal impact.

Table 7. Results of the estimation of stochastic frontier for comparing productivity function between social capital users and non-users.

Var.	All respondents			Respondents that belonged to networks			Respondents that did not belong any network		
	Coefficient	Std error	t-value	Coefficient	Std. error	t-value	Coefficient	Std. error	t-value
Production (X)									
Constant-	24745.03	1.0014	24711.5*	34112.514	14.874	2293.38*	22577.812	64.811	348.36*
Farm size	-932.08	1.008	-924.63*	123.096	17.348	-7.095*	-43.697	127.931	-0.341
Labour	2388.83	1.030	2317.80*	745.239	158.363	4.705*	798.531	210.113	3.800*
Processing Cost	0.0180	0.040	0.450	-0.069	0.1098	-0.629	0.0284	0.0740	0.384
Weeding Cost	-92.201	3.838	-24.012*	37.210	83.871	0.443	304.565	160.775	1.894
Inefficiency (Z)									
Constant	0.0466	1.002	0.047	59.014	14.417	4.093*	99.787	35.996	2.772*
Age	8.1552	1.998	4.081*	0.000	1.000	0.000	99.7872	35.997	2.772*
Edu. Level	2.687	1.097	2.449*	-271.501	134.456	-2.019*	1606.568	579.732	2.771*
Experience	96.465	24.903	3.875*	485.108	251.933	1.926	308.142	119.595	2.576*
HH size	-9.239	2.334	-3.957*	-1037.377	519.424	-1.997*	1446.783	524.329	2.759*
Gender	1.0238	1.016	1.009	257.348	65.181	3.948*	-202.309	73.075	-2.76*
Credit access	11.175	2.891	3.865*	401.088	144.418	2.707*	-	-	-
Mem. Due	11.876	3.092	3.841*	738.098	265.711	2.757*	-	-	-
Variance Parameters									
Sigma (σ^2)	148238210	1.000	148238210	15301203	1.00001	1530096	116473	1.00000	1164
Gamma (γ)	0.0000001	0.00235	0.042	0.000001	0.00000	0.03131	0.9999	0.00027	3659
LR TEST	1.7339184			4.56022*			8.2394*		
Log likelihood	-1080.1260			-539.008*			-524.02*		
Mean efficiency	0.93822			0.9479			0.531		

Field survey, 2017: Computed from frontier 4.1 MLE results/t-values marked at 5% Level of significance

References

- [1] Adofu, A. P. (2011). The Economic Impact of Improved Agricultural Technology on Cassava Productivity in Kogi State of Nigeria Department of Economics, Kogi State University, Anyigba, Nigeria.
- [2] Oparinde, A., Bamire, A. S. Adepitan, A. and Ilona, P. (2012). Situation Analysis of Cassava Farmers' Current Varieties and Practices in Oyo State, Nigeria. Harvest Plus Qualitative Draft Report. Washington, DC, USA: *International Food Policy Research Institute*.
- [3] Umunakwe, P. C., Nwakwasi, R. N. Ani, A. O. Ejiogu-Okereke, E. N. and Nnadi, F. N. Constraints to the Adoption of Improved Cassava Varieties among Rural Farmers in Imo State, Nigeria Department of Agricultural Extension, Federal University of Technology, Owerri, Imo State, Nigeria.
- [4] Iyagba, A. G. and Anyanwu S. O. (2010). Problems and prospects of cassava production in Rivers State, Nigeria: A case study of Oyiibo local government area.
- [5] Bourdieu, P. (1986): The Forms of Social Capital in United Kingdom Office for National Statistics, Social Capital: A Review of the Literature, London.
- [6] Coleman, J. S. (1988): 'Social Capital in the Creation of Human Capital'. *American Journal of Sociology*, 94 (Supplement): S95-SJ20.
- [7] Putnam, R. D. (1993): *Making Democracy Work: Civic Traditions in Modern Italy*. Princeton, New Jersey: Princeton.
- [8] Ishise, H. and Sawada, Y. (2009): 'Aggregate returns to social capital: Estimates based on the augmented Solow model'. *Journal of Macroeconomics* 31 (3): 376-393.

- [9] Imandoust, S. B. (2011): 'Relationship between education and social capital'. *International Journal of Humanities and Social Science*. 1 (12): 52-57.
- [10] Oke, J. T. O Adeyemo, R. and Agbonlahor, M. U. (2007): 'An Emperical Analysis of Microcredit Repayment in Southwestern, Nigeria'. *Journal of Humanity and Social Science*. 2 (1): 63-74.
- [11] Balogun, A. A. (2003). Processing of cassava tuber. Paper delivered at the Workshop on Cassava Production, Processing and Utilization, Benue Hotels, Makurdi 26-28 November.
- [12] Jordan, J. L. Anil, B. and Munasib, A. (2010). Community Development and Local Social Capital. *Journal of Agricultural and Applied Economics* 42, 143-159.
- [13] Afolami, C. A., Obayelu, A. E., Agbonlahor, M. U., and Lawal-Adebowale, O. A. (2012). Socioeconomic Analysis of Rice farmers and Effects of Group Formation on Rice Production in Ekiti and Ogun states, South-west Nigeria. *Journal of Agricultural Science*, 4 (4), 233-244.
- [14] Okorie, O. J. (2012). Level of Adoption of Improved Cassava Varieties and the Profitability of Cassava Production In Enugu State, Nigeria Department of Agricultural Economics University of Nigeria, Nsukka.
- [15] Nsoanya, L. N. (). Adoption of improved cassava production technologies in anambra-east local government area of anambra state Nigeria.
- [16] Adepoju, A. A. and Oni, O. A. (2012): Investigating Endogeneity Effects of Social Capital on Household Welfare in Nigeria: AContro Function Approach. *Quaterly Journal of International Agriculture*. 51 (1): 73-96.
- [17] Awotide, B., Aliou, D. and Omonona, B. T. (2012). Impact of Access to Subsidized inputs for households in South-Western States, Nigeria. *Journal of Agriculture economics* 10 (2): 112-27.