



Socio –Economic Determinants of the Level of Social Capital among Small-Scale Farming Households in Kogi State, Nigeria

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Abstract: Socio-economic factors influencing the level of social capital among small-scale farming households in Kogi State were investigated. A total of 352 farming households were randomly selected across the agricultural zones in the state. Descriptive statistics and multinomial logit regression analysis were employed to analyse the data. The study revealed that farming households belong to three levels of social capital comprising bonding (25%), bridging (12%) and linking (63%). The probability of farming household having bonding social capital relative to bridging social capital increases with sex of the head of household and position held in group, but reduces with age of household head ($p < 0.05$). In the same vein, the tendency of having linking social capital among farming households relative to bridging increases with farm size and amount of credit received by the household as well as age, sex, and level of education of the household head ($p < 0.05$). The study concluded that social capital level is influenced by the socioeconomic characteristics of the farming households. It is therefore recommended that agricultural groups need to be strengthened and supported by government and the community through services in the area of input supply, provision of credit facilities and farm land as well as education of the household members.

Keywords: Determinants, multinomial logit, regression, small-scale, social capital

1. Introduction

Agriculture as reported by World Bank (2014) is the backbone of the rural economy in most African countries. It is the main source of income and employment for 70 percent of the world's poor who live in the rural areas. However, in Nigeria, agricultural sector like in most other developing countries is dominated by small - scale farmers. This category of farmers produce about 80 percent of the total food (Oji-Okoro, 2011; Nations Encyclopedia, 2015) by cultivating between 0.8 to 1.2 hectares in forest area and 2 to 4 hectares in the savannah areas where land preparation is easier (Federal Fertilizer Department, FFD, 2011). Moreover, a number of challenges facing smallholder farmers have been identified as constraints to agricultural production generally in Nigeria and Kogi State in particular.

Some of the challenges include difficulty in acquiring adequate inputs like fertilizer, distance to markets, lack of insurance, inadequate credit facilities, market information, high transaction costs, low investment and expenditure on farm inputs and improved technologies, use of crude tools and equipment and consequently low productivity (Omotesho, 2015). In view of the above, increasing agricultural productivity is a necessity in the sub-Saharan Africa, especially Nigeria. One of the fundamental ways of improving agricultural productivity is by exploiting social capital.

Social capital, which generally refers to trust, social norms, and networks, has been widely recognized in literature in recent times to have positive consequences on economic and social development. It has become a critical issue in

agricultural development as it plays a crucial role in collective actions, such as management of common resources and technology adoption. It is a set of supportive interpersonal interactions that exists in the family and community (Isreal, Beaulieu and Hartless, 2001). At the household level, social capital can be defined as the relationship between different family members that determines how an individual member can take advantage of whatever financial and human capital other family members possess (Martin, Rogers, Cook and Joseph, 2004). At the community level, social capital can be defined as having relational, material and political elements. Social capital consisting of social networks and associated norms have effect on the productivity of the rural community. It facilitates coordination and cooperation, for the mutual benefits of the members of the association. Social capital therefore, as built through households and community involvement, may enhance social responsibility thereby promoting the use of sustainable agricultural farming practices. Therefore, information about agricultural practices to increase crop output may in fact be more effective if shared through social interactions (Abdul, Munasib and Jeffrey, 2011).

Although, a vast variety of issues relating to social learning has been explored in great detail, for instance, studies in Nigeria such as Yusuf (2008); Balogun and Yusuf (2011); and Anyiro (2014) on social capital merely examined issues like poverty, access to micro credit and adoption of certain technologies. Likewise previous studies outside Nigeria such as those of Isham (2000) and Esilaba et al. (2001) to mention a few, indicate that social capital plays an important role in technology adoption but they did not investigate the levels of social capital, and less attention has been paid to the nature and intensity of households and community social structures and economic factors that affect the level of social capital in crop production among small-scale farming households particularly in Kogi State.

This therefore created a gap that this study aims to bridge by examining the different levels of social capital among farming households in

Kogi State so as to understand better how they are influenced by the household members' socio-economic characteristics.

2. Materials and Method

As at 2011, the population of Kogi State was extrapolated to be 3,850,400 million people who comprised 1,986,849 males and 1,863,549 females (projected from 2006 census). The State has distinctive wet and dry seasons, the dry season lasts from November to March while the wet season starts from April and ends by October. The suitable ecological and climatic conditions make it possible to cultivate wide varieties of crops. Farming is the predominant occupation of the people of Kogi State. An average farm family in the state cultivates several plots of land totaling between 2 to 3 hectares (Ibitoye, 2006)

The data used for the study originated from primary source. Information from secondary sources however made up the literature. Random sampling technique was used in selecting the respondents. A total number of 352 farming households were randomly selected across two Agricultural Development Project (ADP) zones in the study area. However, only two hundred and twenty-four (224) respondents who belong to groups were subsequently used for data analysis.

Method of Data Analysis

A combination of descriptive and inferential statistical tools was used to analyze the data obtained from the study. The tools are explained as follows;

Descriptive Statistics: This involves the use of mean, proportion, range, mode, standard deviation, Charts, frequency distribution and percentages.

Multinomial Logistic Regression Analysis: The multinomial logistic regression model was used to estimate the probability of a farming household belonging to a level of social capital. The choice of this model was borne out of its usefulness as a tool for modeling in situation

where the dependent variable is a discrete set of more than two choices.

For the purpose of this study, the model is expressed as in Zhu and Hastie, (2004) as;

$$P(y_{ij}=1)=\frac{e^{\beta_1 \cdot X_i}}{\sum_{k=1}^j e^{\beta_k \cdot X_i}} \quad (1)$$

$$P(y_{ij}=2)=\frac{1}{\sum_{k=2}^j e^{\beta_k \cdot X_i}} \text{ (reference category)} \quad (2)$$

$$P(y_{ij} = 3) = \frac{e^{\beta_3 \cdot X_i}}{\sum_{k=3}^j e^{\beta_k \cdot X_i}} \quad (3)$$

Where,

$X_i = (X_1, X_2, \dots, X_8)$ explanatory variables.

$\beta_j = (\beta_{0j}, \beta_{1j}, \dots, \beta_{8j})$ coefficients to be estimated

$k = 1, \dots, 224$ (total number of farming households who belong to group)

To estimate the model the coefficients of the base outcome are normalized to zero (0). This is because the probabilities for all the choices must sum up to unity. Hence, for 3 choices only (3-1) distinct sets of parameters can be identified and estimated. The natural logarithms of the odd ratio of equations (1) and (3) give the estimating equation as

$$\ln \frac{P_{ij}}{P_{i0}} = \beta_i X_i \quad (4)$$

This denotes the relative probability of each of group 1 and 3 to the probability of the base outcome (group 2). The estimated coefficients for each choice therefore reflect the effects of X_i 's on the likelihood of the farming house head choosing that alternative relative to the base outcome. The coefficients of the base outcome that is the reference category were recovered in line with Rahji and Fakayode (2009) and Nmadu, Eze and Jirgi (2012) as

$$\beta_3 = -(\beta_1 + \beta_2) \quad (5)$$

Where β_3 = coefficient of the variable of the base outcome (bridging social capital),

β_1 = estimated coefficient of the first group (bonding),

β_2 = estimated coefficient of the third group (linking).

For each explanatory variable, the negative of the sum of its parameters for the other groups is the parameter for the reference group.

Quasi- Elasticities

After the estimation, the partial derivatives or marginal effects (dP_j / dX_i) of the model were obtained from the STATA software used in estimating the coefficients (Rahji and Fakayode, 2009). The marginal effects was interpreted as the change in probability of a particular household having a type of the social capital dimension as a unit change in the explanatory variable occurs. Having 'Z' type of social capital dimensions, the effect of changing by one unit of a regressor on the jth probability is as given in the formular for marginal effect estimation thus;

$$dP_{ij}/dX_{iz} = Pr_{ij}(\beta_{1j} - \sum_{z=1}^j Pr_{iz} \beta_{iz}) \quad (6)$$

The marginal effects or partial derivatives were converted to quasi-elasticity. Quasi-elasticity represents the percentage point change in P_{ij} upon a one percent increase in X_{iz} . These elasticities are superior to the coefficients and their derivatives by their ease of interpretation. Like the derivates they may change sign and values when evaluated at different points. The quasi- elasticities were estimated using

$$\eta_{ji} = \bar{X}_{iz} (dP_{ij}/dX_{iz}) \quad (7)$$

Where,

P_{ij} = probability that a farm household i fall in any of the jth category of social capital levels

\bar{X}_{iz} = mean value of X_{iz}

j = dependent variable ranging between 1, 2 and 3

The dependent variable, j , takes values 1, 2 and 3 such that $j = 1, 2$ and 3 if household members have Z_1, Z_2 and Z_3 respectively;

Where, Z_1 to Z_3 are:

Z_1 = Bonding social capital (social capital variables that facilitate creation of cohesion among people such as the extent to which people within the same group or community cooperate with each other, participate in joint activities, and the extent to which they trust one another).

Z_2 = Bridging social capital (social capital variables like membership in groups outside of one's community, extent of financial contributions for group, level of involvement and wider collective activities were used).

Z₃ = linking social capital (social capital variables such as links with extension staff, Fadama, and Bank of Agriculture were used).

The independent variables (X_i) hypothesized to determine the level of social capital among small-holder farming households are as follows:

X₁ = Age of household head (Years)

X₂ = Sex of the farming household head (Male = 1, Female = 0)

X₃ = Educational level of household head (formal education = 1, non- formal = 0)

X₄ = Farm size (ha)

X₅ = Adjusted household size

X₆ = Households farm income (naira)

X₇ = Amount of credit received (amount received in naira)

X₈ = Position held in the group (if leader =1, otherwise = 0)

3. Results and Discussions

The results of the data analysis are presented and discussed in this section.

Description of the Levels of Social Capital among Farming Households in the Study Area

Three major types of social capital have been identified among the farming households in the study area. These are bonding, bridging and linking.

Table 1. Distribution of farming households by levels of social capital in the study area

Level of Social Capital	Frequency	Percentage
Bridging	27	12
Bonding	56	25
Linking	141	63
Total	224	100

Source: Field survey data, 2015

Table 1 shows the description of the farming households according to the level of social capital they possessed. The study revealed that majority (63%) of the household heads possessed linking type of social capital. This category of people represents households who were able to access support, resources and information from corporate organizations and networks. They had connections with government bodies (like ADP and extension agents) and/or Banks particularly Bank of Agriculture. They also receive fertilizer and other support interventions from government through the ADPs. About 25 percent of the households possess bonding social capital. These groups of households who possess bonding type of social capital are categorized as having a kind of horizontal relationships among equals within their community. It is possessed by farming households who share bond and trust with other farmers within the same group in their community. Those who possess bridging social

capital are the category that belongs to group outside their community. They are members of groups such as cassava growers association. About 12 percent of the farming households possessed this type of social capital. This result is in line with Njuki et al. (2008) who categorized social capital among farmers in Chinyanja Triangle of southern Africa into bonding, bridging and linking.

Socio-economic Determinants of the Levels of Social Capital among Farming Households in Kogi State

This sub-section explains the empirical result of the socio-economic determinants of the various levels of social capital among farming households. The variables tested were age of household head, gender of head, highest education attained, household size, household income, amount of credit received and position held in group. The result is as presented in Table 2.

Table 2. Estimated output of multinomial Logit Model for determinants of level of social capital among farming households in Kogi State

Variables	Bonding Parameters	Linking Parameters	Bridging (reference category)
Age of household head (X ₁)	-0.1135** (0.0506)	0.9369** (0.0452)	1.0504
Sex of household head (X ₂)	1.2888** (0.5678)	2.9370** (1.1844)	-4.2258
Education level of head (X ₃)	-0.5787 (0.3708)	0.6607** (0.2447)	1.2394
Farm size (X ₄)	0.2766 (.1560)	1.2595** (0.4214)	1.5361
Adjusted household size (X ₅)	0.2364 (0.2032)	0.2179 (0.1516)	0.4543
Household farm income (X ₆)	0.9329 (.4826)	-0.6678 (0.4633)	-0.2651
Credit received (X ₇)	-2.93e ⁻⁰⁶ (3.50e-06)	9.43e-06** (3.28e-06)	-6.5000
Position held in group (X ₈)	3.2493** (1.2220)	17.022 (7161.4870)	-20.2713
Constant	-14.2816 (1617.101)	15.5717 (7161.487)	29.8533
Log likelihood	-289.6679		
Log likelihood ratio λ	167.6172		
Pseudo R ²	0.3163		
Confidence interval	95%		
N	56	141	27

Source: Computed from Field Survey Data, 2015. ** Significant at 5 percent figures in parenthesis are standard errors

The result of the multinomial logistic regression is presented in Table 2. The model posted a pseudo R² value of 0.3163 and a goodness of fit likelihood ratio chi square value of 167.6172 with degree of freedom value of 10 which is statistically significant at 1 percent level of probability. Overall, the model statistics describes the model as displaying a good fit and normal distribution of the error term. The explanatory variables are collectively significant in explaining the levels of social capital among the farming households. The response variable is the level of social capital, in this model, the middle level of social capital (bridging) was set as the reference group and therefore the model for bonding was estimated relative to bridging likewise the model for linking was estimated relative to bridging type of social capital. Therefore since parameter estimates are relative to the reference group, the interpretation is that for a unit change in the predictor variable, the logit of outcome relative to the reference group is expected to change by its respective parameter estimate given that other variables in the model are held constant. As such age and sex of household head as well as position held in group are the factors that significantly influence bonding social capital relative to bridging social capital.

If age of household head were to increase by one unit, the probability of having bonding social capital relative to bridging would be expected to reduce by 0.1135 units while holding all other variables in the model constant. This implies that as household heads grow older, they tend to know more people, associate with groups outside their community and therefore move to a higher level of social capital. Sex of household head was positive and significantly related to level of social capital. Thus, probability of household head being male increases with bonding social capital relative to bridging social capital.

Position held in group was also found to be significant at 1 percent and positive. It thus implies that the higher the position held by household head (if household head holds leadership position rather than being ordinary member), the higher the tendency for him to remain on bonding level relative to bridging level of social capital. There is every tendency that he would be more attached to the local group because of the leadership position. A unit increase in the level of position held will increase the log-odd for bonding relative to bridging by 3.249 other variables being held constant. Increased level of participation due to higher position in group may discourage participation in other

groups outside the community probably because of the level of commitments.

In the second section, age, sex, level of education, farm size and amount of credit received were the significant factors influencing the level of social capital. If a household head was to increase his age by one unit, the probability of being at linking level of social capital relative to bridging would be expected to increase by 0.937 units while holding all other variable in the model constant. This means that age of household head increases with linking social capital relative to bridging social capital. This may be as a result of the fact that age is associated with higher level of social capital. Also, the probability of household head being males relative to females is 2.937 units higher for possessing linking social capital relative to bridging social capital given that all other variables are held constant. This may not be unconnected with the fact that males make better and stronger connections with corporate organizations than their female counterparts.

More also, if a household is to increase level of education of head by one unit, the probability of linking social capital relative to bridging would be expected to increase by 0.661 units given that all other variables in the model are held constant.

This is probably due to the fact that when peoples' level of education is higher, they tend to be more exposed to corporate connections and network. This increases the chance of possessing linking social capital and to remain on that level than move to lower level of bridging.

The amount of credit received was also significant at 1percent and positive implying that a unit increase in the amount of credit received by household head would result to 9.43×10^{-6} unit increase in the probability of having linking social capital relative to middle level bridging social capital while holding all other variables constant. This may be attributed to the fact that having corporate connection and networking facilitate easier access to credit facilities and joining groups outside the community to enjoy such facilities may not be unexpected. This result compares favourably with Ajani and Tijani (2009).

Marginal Effects and Quasi-elasticities of Significant Variables

Table 3 shows the values of the estimated marginal effects and the quasi-elasticities calculated as the overall sample means for the significant variables.

Table 3. Marginal effects and quasi-elasticities of significant variables

Variables	Bonding	Linking	Bridging
Age of household head	0.0087(0.4454)	-0.0321(1.6435)	-0.0048(0.2458)
Sex of household head	-0.0675(0.0635)	-0.0038(0.0036)	0.3705 (0.3483)
Education Level of head	-	- 0.0089(0.0511)	0.0207(0.1188)
Farm size	-	-0.3150(0.7403)	0.1950 (0.4583)
Amount of credit received	-	-0.0023(529.38)	0.9958(229.19)
Position held in group	0.0075(0.0044)	-	0.5827(0.3438)

Source: Computed from Field Survey Data (2015). Figures in parenthesis are quasi-elasticity

The quasi-elasticity of age of household head and amount of credit received for linking social capital were elastic at 1.6435 and 529.38 respectively. Quasi-elasticities for bonding were low and inelastic. It can be deduced from this result that the elasticity of any household head belonging to bonding or linking level of social capital relative to bridging social capital is influenced by the marginal changes in the variables that are elastic. The elastic variables are

those that would lead to increase in the level of social capital. This result is similar to Rahji (2006).

4. Conclusion and Recommendations

Social capital has prospects for farming households. When farmers come together, they are able to pool their resources together for economic empowerment by taking advantage of social capital as contact point for extension

services and establishing links even with government institutions responsible for agricultural development programme. It can be concluded from this study that level of social capital is well influenced by the social economic characteristics of farming households particularly age, level of education, amount of credit and farm size. Based on the conclusion it is recommended that:

1. Non- groups members need to be encouraged to join group to enable them possess social capital. This can be achieved by supporting and strengthening the existing groups through provision of services like supply of inputs at reduced price, provision of credit facilities, by government and the community.

2. The community should make more land available and groups need to encourage members to cultivate more land since increase farm size is a significant factor in determining level of social capital.

3. Education and awareness is paramount among farming households for improved crop production. Therefore, effective extension service delivery is recommended to create awareness and educate the farming households on social capital. Privatization of extension services could also be an option for effectiveness.

References

- Abdul, B., Munasib, A. and Jeffrey, L. J. (2011). The effect of social capital on the choice to use sustainable agricultural practices *Journal of Agricultural and Applied Economics*, 43(2), 213–227.
- Ajani, O.I.Y. and Tijani, O.A. (2009). The role of social capital in access to microcredit in Ekiti State, Nigeria. *Pakistan Journal of Social Sciences* 6(3): 125-132
- Anyiro, C.O. (2014). Social capital dimensions and its implications on poverty status of rural farm households in Abia State, Nigeria. *The Nigerian Agricultural Journal*, 45 (1and2), 102-118.
- Balogun, O. L and Yusuf, S. A. (2011): Effect of social capital on welfare of rural households in south-western states, Nigeria. *Journal of American Science*, 7(3), 506-514.
- Esilaba, A. O., Byalebeka, J. B., Nakiganda, A., Mubiru, S., Ssenyange, D., Delve, R. J., Mbalule, M. and Nalukenge, G. (2001). Integrated nutrient management in Iganga district, Uganda: Diagnosis by participatory learning and action research. Centro Internacional de Agricultura Tropical (CIAT), Network on Bean Research in Africa, Kampala, UG. 71p (CIAT Africa occasional publications series no.35). Retrieved from http://ciatlibrary.ciat.cgiar.org/Articulos_ciat/op35_diagnostic.pdf
- Federal Fertilizer Department (FFD), (2011). *Fertilizer use and management practice for crop in Nigeria*, (4th edition). Abuja. Federal Ministry of Agriculture and Rural Development.
- Ibitoye, S.J. (2006). The impact of cooperative society on rural development in Akpan Local Government Area of Kogi State Nigeria. *National Association of Science, Humanitie and Education Research Journal*, 4(2), 193-198.
- Isham, J. (2000). Can Investments in Social Capital Improve Local Development and Environmental Outcomes? A Cost-Benefit Framework to Assess the Policy Options. Paper prepared for Middlebury College's (21st Annual Conference on Economic Issues). Middlebury, VT
- Isreal, G, Beaulieu, L. and Hartless, G. (2001). The influence of family and community social capital on educational achievement. *Rural Sociology*, 66, 45-68.
- Martin, K., Rogers, B. Cook, J., and Joseph, H. (2004). Social capital is associated with decreased risk of hunger. *Social Science and Medicine*, 58, 2645-2654.
- National Encyclopedia (2015). *Nigerian Agriculture*. From www.nationsencyclopedia.com/Africa/Nigeria-agric.htm
- Njuki, J.M., Mapila, M.T., Zingore,S. and Robert, D. (2008). The dynamics of social capital in influencing use of soil management options in the Chinyanja triangle of Southern Africa. *Ecology and Society*. 13(2): 9. [Online] URL: <http://www.ecologyandsociety.org/vol13/iss2/art9>.
- Oji-Okoro, I. (2011). Analysis of the contribution of agricultural sector on the Nigerian economic development. *World Review of Business Research*, 1(1), 191–200.
- Omotosho, O.A. (2015). Let the small-scale farmers be in good standing. University of Ilorin 158th inaugural lecture series. ISBN 978-978-53221-6-3. Ilorin, Nigeria. Unilorin Press.
- Nmadu, J. N., Eze, G. P. and Jirgi, A. J. (2012). Determinants of Risk Status of Small Scale Farmers in Niger State, Nigeria. *British Journal of Economics, Management and Trade*, 2(2): 92-108, 2012.
- Rahji, M.A.Y. (2006). Tropical Agriculture (Trinidad) in press.
- Rahji, M.A.Y. and Fakayode, S.B. (2009). A multinomial Logit Analysis of agricultural credit rationing by commercial banks in Nigeria. *International Research Journal of Finance and Economics*, Issue 24, 90-100.
- World Bank, (2014). Agriculture and rural development data. The World Bank. Retrieved from www.data.worldbank.org/.../agric-and-rural-development-
- Yusuf, S.A. (2008). Social capital and households welfare in Kwara State, Nigeria, *Journal of Human Ecology*; 23(3), 219-229.
- Zhu, J. and Hastie, T. (2004). Classification of gene microarrays by penalized logistic regression. *Biostatistics*, 5(3), 427-443. Retrieved from <https://books.google.com.ng/books?isbn=026219582>.