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Effects of Social Network on Production Output of Maize Farmers in Kwara State, Nigeria

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In developing countries, like Nigeria, the potential for enhanced agricultural productivity is great. However, smallholder farmers who account for vast majority of farmers in Nigeria often have restricted access to productive resources. Social capital has been identified as a veritable factor in giving great opportunities, as regards access to resources. Therefore, the effect of social network on productivity of maize farmers in Kwara State, Nigeria was investigated. Primary data were collected from one hundred and fifty maize farmers using a multistage random sampling procedure. Data were analyzed using descriptive statistics, Total Factor Productivity and ordinary least square (OLS) regression. Results showed that labour contribution and decision making index of farmers are the only significant variables affecting productivity. Results of the two stage least square reveals the exogeneity of social capital. The existence of bi-directional causality between social capital and maize farmers' productivity indicated the absence of significant reverse causality and thus confirms the exogeneity of social capital. The study recommends that farmers in the rural areas should be involved in local level institution's activities as a way of reducing poverty, which consequently will improve agricultural productivity at large.

Keywords: social capital, productivity, smallholder, maize farmers, Kwara State

INTRODUCTION

Agriculture plays a major role in the economy of many developing countries, as it is a significant source of nourishment for citizens and a means of livelihood for the most vulnerable members of these countries. As a consequence, raising agricultural productivity is an important policy goal for concerned governments and development agencies (Liverpool *et al.* 2011).

One major source of achieving a drastic reduction in poverty and alleviating the poor welfare situation of the rural farmers is to increase agricultural productivity. This will, at the micro level, translate to an increase in farm income, food security, poverty reduction, and improved rural household welfare, while leading to inclusive industrial development and economic growth on the aggregate (Awotide *et al.*, 2015). Kuznet (1964) cited in Awotide *et al.* (2015) posited that an increase in agricultural productivity can support and sustain industrial development in many dimensions. It allows the agricultural sector to release its

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labor force to the non-agricultural sector while meeting the food demand of the non-agricultural sector. It also raises agricultural sector income and creates rural purchasing power needed to purchase industrial goods. In addition, it enables the agricultural sector to supply food to industrial workers at affordable prices to the profitability of the industries.

Agricultural productivity is a measure of the performance of the agricultural sector and thus provides a guide to the efficiency of the sector (Conradie *et al.*, 2009 cited in Awotide *et al.*,2015)**.** Increasing agricultural productivity requires one or more of the following: an increase in output and input with output increasing proportionately more than inputs; an increase in output while inputs remain the same; a decrease in both output and input with input decreasing more; or decreasing input while output remains the same (Adewuyi 2006; Oni *et al.*, 2009).

Increasing inputs in order to expand output involves raising both the quality and quantity of inputs, examples of which would include the mechanization of agricultural processes, use of high yield varieties, use of fertilizers, irrigation in areas where rainfall is inadequate, and the use of agrochemicals such as herbicides and pesticides. Though all of the aforementioned activities have the potential for productivity enhancement, smallholder farmers, who account for the vast majority of farmers in developing countries, often cannot afford these investments due to their limited resources and restricted access to credit. (Liverpool *et al.*, 2011)

On the other hand, increases in food production can be achieved either by increasing the land area under cultivation or by increasing farmers' productivity (Adeoti & Olayemi, 2003). Also, Olayemi(1995) cited in Adeoti & Olayemi (2003) suggests that the focus of food production policies in Nigeria should be the rapid improvement in the resource productivity in food production. Some empirical studies in developing countries have included social capital in the household production function and found that social capital contributed to households' productivity (Iyanda 2015; Ha *et al.*, 2006).

This informed the need for this study because hitherto there is a dearth of rigorous research studies that explicitly explore the role that social capital plays in stimulating agricultural productivity in rural Nigeria (Liverpool *et al.*, 2011). Hence this study sets out to examine whether social capital can impact on productivity of maize farmers' in the Kwara State, Nigeria.

Social capital and agricultural productivity

The concept of social capital as an important determinant of economic development is attracting increasing attention among development economists. Social capital in every sense is one of the fundamental factors of development. No country can achieve sustainable economic expansion without substantial investment in human capital. Social capital is an instantiated informal norm that promotes cooperation between individuals Social capital enriches people's understanding of themselves and the world (Fukuyama, 1995).

Social capital is important to the co-efficient functioning of modern economies. Macro-level social capital comprises different aspects of institutional quality and is closely related to the income distribution and social cohesion. Social networks may indirectly affect agricultural productivity by influencing farming practices and the household' propensity to adopt newer technologies via the supply of information through these networks (Katungi, 2007; Liverpool and Winter-Nelson, 2010). Social capital may also indirectly impact agricultural productivity by affecting the quantity of labor available either from the immediate and extended family or through the social relationships available to the individual. This is particularly important with the increase in rural-urban migration, which has created restrictions in the supply of rural farm labor.

In agriculture, evidence suggests positive effects of social capital on productivity among farmers using modern technologies, but less impact, as might be expected, among those using traditional methods (Birdsall, 1993; Jamison & Moock, 1994). Social capital manifested in community-based organizations or in personalized social networks has been found to play an important role in the adoption of crop technologies (Isham, 2000; Katungi, 2007). Organizations may generate externalities such as information about new technologies (Colliers, 1998) that may facilitate adoption decisions. The externalities generated by local organizations may vary as a function of the characteristics and functioning of these organizations. We hypothesize that the density of household participation influences its capacity to acquire information from the social network and the extent to which a household decisions are influenced by the decisions of other households. This aspect of organization is also expected to influence the use of banana production technology directly since it measures participation in organizations that deal with economic activities, which may reduce expenditure constraints on labour use (Narayan, 1997).

The idea of social capital has become very significant in agricultural production due to the inability of the formal capital institutions to take care of all requirements in agricultural production. Fafchamps and Minten (2001) were able to identify some areas where social capital has played important role in agricultural production in India, these include: Farmer to farmer exchange of wilt resistant pigeon pea seeds, in the absence of state support for an appropriate and needed innovation in the Viharbha and Marathwada, kinship community and other informal networks.

On the other hand, Van den Broeck and Dercon (2007) found that agricultural information flows give rise to social learning effects that led to increased banana cultivation in Nyakatoke, Tanzania. The results showed that social

effects are strongly dependent on the definition of the reference group. It emerges that no social effects are found in distance based groups, exogenous social effects linked to group education exist in informal insurance groups, and only kinship related groups generate the endogenous social effects that produce positive externalities in banana output. In other study, Odebode and .Adetunji (2010) examined the contributions of social capital to banana/plantain production in Irewole local Government Area, Osun State. The study showed the indispensable of social networks in among banana/plantain producers in Nigeria..

MATERIALS AND METHODS

The study was conducted in Kwara State. The State is adjudged as one of the optimal regions of maize production in Nigeria (Muhammed-Lawal *et al.* 2013). It was created on 27th May, 1967. Its capital is Ilorin. Kwara State has sixteen (16) Local Government Areas with a population of 2,371,089 (NPC, 2006). It shares local boundaries with Oyo, Ondo, Ekiti, Osun States to the South; Kebbi and Niger to the north; Kogi to the East and an international border with the Republic of Benin to the West (KWSG Diary, 2006).

Kwara State has a land area of about 35,705 square kilometer (Sq Km) and it is located between latitude $8º5'$-$10º4'N$ and longitude$4º55'$-$6º5'E$ (NPC, 2006). The average temperature ranges between $27º$ and $35ºC$ with a mean annual rainfall of 1,000-1,500mm. It has two main seasons-wet and dry. The wet season is between early April and late October while the dry season is between November and late March. The natural vegetation cover consists of rainforest in the South and Guinea Savannah to the North. The climatic condition, soil type, topography and vegetation cover in the state support the cultivation of several crops of economic importance like maize, cassava, vegetables, millet, rice, yam cowpea, sorghum etc. The State is also suitable for raising livestock.

Primary data used in this study were collected from maize farmers using a multi-stage sampling technique. The first stage was the random selection of two local government areas (LGA) from the state. In the second stage, five villages were selected from each of the LGAs. The last stage involved the random selection of maize farmers from each of the villages for interview.

Consequently, only one hundred and fifty farmers that gave complete required information were used for analysis. Hence, these farmers constituted the sample size for the study. Analytical techniques employed include descriptive statistics and ordinary least square regression model. Descriptive statistics such as frequency, tables, percentages and means were used to analyze maize farmers' socio-economic characteristics and ordinary least

square regression was used to analyze whether social capital can impact on productivity of maize farmers

The Ordinary Least Square model was used in estimating the effect of social capital on productivity of arable crop farmers. The analytical frame work for the study derives mainly from household utility maximization as adopted by (Okunmadewa *et al*, 2005, Yusuf, 2008; Balogun and Yusuf 2011). In relating social capital to arable crop farmer's productivity, the customary or conventional model of household economic behaviour under constrained utility maximization relates the level of farmer productivity directly to the exogenous asset endowments of the household and variables describing the social and economic environment in which the farmers' makes decision.

The total factor productivity model was adopted and used in this section borrows from work of Key and McBride (2003). The model is approximated by a linear relationship. The Total Factor Productivity (TFP) is measured as the inverse of the average unit cost of production in line with Key and McBride (2003). It is defined as the inverse of the ratio of total variable cost to total output.

$$TFP = \frac{Q}{TVC} \quad or \quad \frac{1}{AVC}$$

$$= Q/\sum_{i=1}^{n} P_{xi} X_i$$

n variable inputs

$$TFP = f(X_1, X_2, X_3, …, X_n) ……………………………………….. (1)$$

$$TFP = a + ÎX_i + gQC_i + bSC_i + u_i ……………………….(ii)$$

TFP= Total Factor Productivity = Kg per Naira.

Independent variables

X_1= Sex of farmer (1=Male; 0=Female).
X_2 = Age of farmer (Years)
X_3= Household size (numbers)
X_4= Years of formal education (Years)
X_5 = Marital status (Yes =1 if Married, 0=Otherwise)
X_6= Farming experience (Years)
X_7 = Farm size (Hectare)
X_8 = Interest rate on loan (%)
X_9 = Time lag (Weeks)
X_{10} = Meeting attendance index (%)
X_{11} = Decision making Index (%)
X_{12} = Density of membership (number)
X_{13} = Cash contribution index of households to associations (Naira)
X_{14} = Labour contribution index of households to associations (man-day)
X_{15} = Heterogeneity index of associations (%)

Table 1: A priori expectation of the exogenous variables affecting farmers' productivity

Variables	Description	Expected Signs	Literatures
Sex X_1	Dummy	±	
Age X_2	Continuous	±	
Household size X_3	Continuous	±	
Years of formal education X_4	Continuous	±	
Marital status X_5	Dummy	±	
Farming experience X_6	Continuous		
Farm size X_7	Continuous	+	Adeyemo, Oke and Akinola 2010; Akintayo 2011
Interest rate on loan X_8	Continuous		
Time lag X_9	Continuous		
Density of membership X_{10}	Continuous	+	Katungi 2007; Liverpool, Winter-Nelson 2010
Decision making index X_{11}	Continuous	+	Katungi 2007; Liverpool, Winter-Nelson 2010
Heterogeneity Index X_{12}	Continuous	+	Katungi 2007; Liverpool, Winter-Nelson 2010
Meeting attendance index X_{13}	Continuous	+	Katungi 2007; Liverpool, Winter-Nelson 2010
Cash contribution X_{14}	Continuous	+	Katungi 2007; Liverpool, Winter-Nelson 2010
Labour contribution X_{15}	Continuous	+	Katungi 2007; Liverpool, Winter-Nelson 2010

Source: Authors' compilation, 2012

Social Capital construct

It has been argued that social capital like physical capital can be in part consumption good (Grootaert, 1999). It is therefore imperative to validate the assumption of social capital being truly a capital. In order to do this, the study will investigate the existence of bi-causality between social capital and productivity with the aid of an instrumental variable.

Density of membership: This is measured by the number of farmer's membership in existing associations. A complete inventory existing associations was made at the farmer was then given that inventory and asked which associations they are members. In other words, the proportion of membership of associations by arable farmer's was found and rescaled to 100.

Decision making index: It has been argued that associations, which follow a democratic pattern of decision-making, are more effective than others. The questionnaire asked association members to evaluate subjectively whether they were "very active" "active" or "not very active" "passive" "very passive" or not participating in the group's decision making. This response was scaled from 4 to 0 respectively, and averaged across the three most important groups in each household. The summation was calculated from subjective responses from the households' members on their rating in participation in decision making in three important associations to them. The responses were averaged across the three associations and multiplied by 100 for each.

Heterogeneity index: The questionnaire identifies the three most important associations for each farmer. For those associations, a number of supplementary questions were asked including the internal homogeneity of the group. This was rated according to twelve criteria: neighborhood, kin group, same occupation, same

Table 2: Selected characteristics of maize farmers

Variable	Mean	SD	Minimum	Maximum
Age	45.8	11.9	23.0	76.0
Household size	6.7	3.1	1.0	18.0
Time lag (weeks)	4.7	3.2	0	20
Social capital aggregate (%)	20.45	14.16	0	100.0
Decision Making Index (%)	52.61	14.45	37.5	100.0
Membership density	4.4	2.0	1	10
Cash contribution (Naira)	1933.74	1379.13	0	6100
Meeting attendance (%)	50.35	16.60	13.63	100.0
Labour contribution (man-day)	0.571	0.111	0.0	1.2
Heterogeneity index (%)	61.14	5.94	53.33	76.15

Authors' compilation, 2012

economic status, same religion, same political, same gender, same age, same education level, cultural practices, belief and trust. Hence, for each of the factors a yes response was coded 2 while no was coded 1 (Lawal *et al.*, 2009). A maximum score of 24 for each association represents the highest level of heterogeneity. The score of the three associations were averaged for each arable farmer by dividing by maximum score 72 to obtain the index. The resulting index was then multiplied by 100 (whereby a zero value represents complete homogeneity and 100 correspond to the highest heterogeneity).

Meeting attendance index: This index was measured by finding the number of times members of association actually met as a group over a period of time This is obtained by summing up of attendance of the farmer house arable farmer's household members at meeting and relating it to the number of scheduled meetings of the associations. The value is multiplied by 100.

Cash contribution index: This was achieved by taking records of payment of membership dues and other contributions. The summation of the total cash contributed to the various associations, which the farmer's belongs to was calculated. The actual contribution for each farmer was rescaled by dividing the amount by the contribution by household members relative to average data and multiplying the resultant fraction by 100.

Labour Contribution index: This is the number of days that individual members belonging to institution claimed to have worked for their institutions. This represents total numbers of man- hour's days worked by farmer's household members. This is also rescaled to 100 using the same method of cash contribution

Aggregate Social Capital Index: This was obtained by the multiplication of density of membership, heterogeneity index and decision making index Following Grootaert

(1999), The resultant index is normalized to maximum value of 100.

RESULTS AND DISCUSSIONS

The summary statistics of some selected characteristics of maize farmers is shown in Table 2. The result shows that the mean age and household size of maize farmers were 46.0±11.9 years and 7 ± 3.1 persons respectively; depicting that they were in their economically active and productive years. This is consistent with the findings in Iyanda et al. (2014) and Yusuf (2008) that reported an average household size of 7 persons for farmers in southwest Nigeria. Time lag for credit procurement was about 4.7 weeks and participation in decision making was moderate (51.5) among the farmers while their labour contribution in association they belong was low.

Table 3 depicts the effect of social capital on productivity of maize farmers in Kwara state Nigeria. The basic model is shown in the first column of the table. This model shows that about 18.4% of the variations in productivity of maize farmers were explained by the specified socio-economic/demographic, farm specific and credit variables. However, the result reveals that only age and household size significantly affected farmers' productivity. Age of farmer is positive and significantly increased farm productivity. A year increase in age of farmer increased his/her productivity by 0.86%. The implication is that, as farmer advances in age, his/her experience increases and there is tendency to adopt technology that will increase production output. In case of large household, the result reveals a reduced productivity with increase in household size. The implication might be because the increase in household size is not being used for agricultural

Table 3: Effect of Social capital on maize farmers' productivity with and without instrument

Variables	Basic model		Multiplicative model		Additive model			Social capital without Instrument	Social Capital with Instrument
	Coefficient	T-stat	Coefficient	T-stat	Coefficient	T-stat		Coefficient	Coefficient
Constant	4.7907	19.31***	4.9214	19.31***	4.9282	13.78***		4.9214(19.31)***	5.7959(7.68)***
Sex	-0.0539	-0.54	-0.0407	-0.41	-0.0439	-0.43		-0.0407(-0.41)	-0.0919 (-0.69)
Age (yrs)	0.0086	1.80*	0.0075	1.58	0.0059	1.23		0.0075(1.58)	0.0006(0.22)
Marital status	-0.2060	-1.50	-0.2034	-1.49	-0.1799	-1.28		-0.2034 (-1.49)	-0.0981(-0.51)
Household size	-0.0824	-4.92***	-0.0778	-4.64***	-0.0772	-4.59***		-0.0778(-4.64)***	-0.0917(-4.04)***
Education(yrs)	0.0068	0.80	0.0085	1.00	-0.0007	-0.08		0.0085(1.00)	0.0007(0.06)
Farming Experience(yr)	-0.0057	-0.90	-0.0045	-0.71	-0.0039	-0.63		-0.0045(-0.71)	-0.0239 (-1.61)
Farm size(ha)	0.0255	0.75	0.0214	0.64	0.0360	1.09		0.0214(0.64)	0.0836(1.42)
Interest rate charged	0.0071	1.26	0.0078	1.38	0.0049	0.87		0.0078(1.38)	0.0001(0.02)
Credit time lag (%)	-0.0121	-1.48	-0.138	-1.69*	-0.0119	-1.43		-0.138(-1.69)*	-0.0174 (-2.02)**
Social capital (%)			-0.0092	1.93*				-0.0092(1.93)*	-0.0155(2.47)**
Density of membership (number)					-0.0020	-0.94			
Decision making Index (%)					-0.0049	-1.73*			
Cash contribution (Naira)					0.0013	0.58			
Labour contribution index (manday)					0.0063	3.26***			
Meeting attendance index (%)					0.0006	0.22			
Heterogeneity index (%)					0.0008	0.31			
Number of observation	150		150		150			150	150
F-statistic	4.78		4.76		4.37			4.76	3.46
R^2	0.235		0.2551		0.3285			0.2551	0.2764
Adj R^2	0.1858		0.2015		0.2533			0.2015	0.238

Significance level at ***1%; **5%; *10%

Source: Field survey, February 2012

production, hence, depleting other resources that could have been put into production (Iyanda et al., 2014).

Moreover, the second column of the table depicts the multiplicative social capital variables. The inclusion of this variable led to slight improvement in the adjusted R^2, along with the socio-economic/demographic variables, aggregate social capital index significantly influenced the farmer's productivity. The variables that significant affected farmer's productivity were household size, credit time lag and aggregate social capital. The result shows that an increase in household size reduced farmer's productivity by 7.8% while a week increase in credit time lag decreased farmer's productivity by 0.14. At mean social capital index of 16.22, the coefficient of the variables shows that 100% increase in

social capital increased productivity of farmer by 0.92%. The result supports Adeyeye (1986) and Idumah (2006) who observed that social capital enhances productivity among crop farmers in the humid forest, dry savannah, and moist savannah agro-ecological zones of Nigeria. This is likely due to the fact that social network tends to promote membership welfare and reduce conflict, which is important for enhancing productivity of farming households.

The third column of the table shows the inclusion of six additive dimensions of social capital variables identified by this study. These include: density of membership, decision making index, cash contribution index, labour contribution index, meeting attendance and heterogeneity index. This new model has a better explanatory power as reflected in the adjusted R^2 of 0.253. This disaggregation shows that the effects of socio-economic/demographic, social capital and credit variables on productivity were traceable to household size, decision making index and labour contribution. The result implies that active participation in decision making actually decreased farmer's productivity. Thus, high level of commitment to associations can reduce productivity of farmer if the time he supposes to attend to farm issues were spent attending to association's matters that are of no benefit to the farmer. However, labour contribution index was found to positively affect maize farmers' productivity. According to Iyanda (2015), that labour contribution otherwise called *Aaro* in local parlance, (*Aaro* is a source of labour reciprocity in which members exchange turns on one another's farm), ability to reduce the cost of labour has productivity enhancing effect on farmers. The result also indicates that an additional member to household resulted in 7.7% reduction in farmer's productivity. This is the situation when the additional member is not contributing into labour needs of the farmers. The table further presents the result of the existence of bi-directional causality with the aid of instrumental variable. Using the aggregate social capital model, the original social capital index was replaced by an instrumental variable index of trust. The result of the instrumental variable showed an improvement in the adjusted R^2 from 0.2015 to 0.238 compared with the use of the actual social capital index. The instrumental variable method leads to higher coefficient (0.0155) for the social capital index than in the OLS method where it was 0.0092. A reverse causality could have been accepted if there is no improvement or reduction in R^2 as well as reduction or lack of improvement in the instrumented variable. Since, there is improvement on both counts, one can infer the absence of significant reverse causality and thus confirms the exogeneity of social capital. However, 100% increase in the level of instrumented social capital increased output per naira of maize farmer by 1.2%. This is 0.63% point higher than the value recorded for the OLS estimation.

CONCLUSIONS AND RECOMMENDATIONS

This study explored the role that social network plays in stimulating agricultural productivity in rural Nigeria. Social capital has been identified to be a veritable factor in giving great opportunities, as regards access to resources which often hinder farmers' production if lacked. Therefore, based on the empirical evidence emanating from analytical tools employed for this study, the following conclusions may be made:

Results revealed that, farmers' household size reduce his productivity. The implication is that an additional member to household is not being used for agricultural production, hence, depleting other productive resources that could have been put into production. In the same vein, an increase in time when credit is requested for and actual securing it (credit time lag) significantly reduced farmers' productivity. On considering the social capital variables, the result further indicated that labour contribution of the farmers to associations they belong enhance farmers' productivity while, conversely, decision making index caused a reduction farmers' productivity.

On the other hand, examining the existence of bi-directional causality between social capital and farmers' Productivity, the result indicated the absence of significant reverse causality and thus confirms the exogeneity of social capital. Hence 100% increase in the level of instrumented social capital increased per capita output of arable crops farmers by 1.2%. This is 0.63% point higher than the value recorded for the OLS estimation.

Consequent on the foregoing, the following is recommended for policy considerations:

•   Credit time-lag was found to decrease farmers 'productivity in Kwara State. Given the timeliness required in agricultural production, it is thus suggested that both private and government organizations should be involved in timely delivery of credit. Also, farmers should exploit their social capital, as it has been found to enhance timely access to productive resources including credit.

•   Farmers in the rural areas should be encouraged to be involved in local level institution's activities as a way of reducing poverty, which consequently will improve agricultural productivity at large. It is not enough to belong to a local organization, active participation in such organization is very important and this can be achieved through regular meeting attendance and directly involve in the decision making of the group.

REFERENCES

Abdoulaye BA, Alene TA, Manyong VM (2015). Impact of Access to Credit on Agricultural Productivity: Evidence from Smallholder Cassava Farmers in Nigeria. A Contributed paper Prepared for Oral Presentation at the International Conference of Agricultural Economists (ICAE) Milan, Italy August 9-14, 2015

Adewuyi SA (2006). "Resource Use Productivity of Rural Farmers In Kwara State, Nigeria." PhD Thesis, Department of Agricultural Economics, University of Ibadan. Ibadan

Adeyeye VA (1986). "Relative Economic Efficiencies in Farm Organizations: A comparative

Akinola AA, Adeyemo R (2008). "Adoption and Productivity of Improved Rice Varieties In Osun State, Nigeria." Ife Journal of Agriculture 23(1):104-116

Awotide BA, Abdoulaye T, Alene A, Manyong VM (2015). Impact of Access to Credit on Agricultural Productivity: Evidence from Smallholder Cassava Farmers in Nigeria. A Contributed paper Prepared for Oral Presentation at the International Conference of Agricultural Economists (ICAE) Milan, Italy August 9-14, 2015.

Banana Production Technology in Uganda." Ph.D Thesis, Department of Agricultural

Economic Papers 54: 173-206

Economics, Extension & Rural Development, University Of Pretoria, South Africa

Fafchamps M, Minten B (2002). Returns to social network capital among traders. Oxford

Fukuyama F (1995). Trust: The social virtues and the creation of prosperity. Free Press, New York. 457pp. DOI: 10.1016/S0030-4387(96)90073-3

Grootart C (1999). Social capital, household welfare and poverty in Indonesia. Social Capital

Ha NV, Kant S, Maclaren VW (2006). Relative shadow prices of social capital: An input distance function approach. Ecological Economics 57 (3): 520–533

Idumah FO (2006). "Productivity Differentials among Food Crop Farmers in the Niger Delta."

Initiative Working paper No. 2148 Washington DC. World Bank. www.socialcapitalgateway.org/NV-eng-povertyquality.htm-44k

Isham JT (2000). A model of technology adoption with Social capital. Ph.D. Thesis. University of Maryland, USA

Iyanda JO (2015). Social capital, Credit and Farmers' Efficiency in Southwest, Nigeria: Status, Access and Determinants of Production Efficiency among Cassava Farming Households in Ogun State, Nigeria. LAP LAMBERT Academic Publishing, Germany. ISBN: 978-3-6597-4486-0

Iyanda JO, Afolami CA, Obayelu AE, Ladebo OJ (2014). Social capital and Access to Credit among Cassava Farming Households in Ogun State, Nigeria. Journal of Agriculture and Environmental Sciences.3 (2):175-196DOI: 10.15640/jaes

Jamison DT, Moock PR (1984). Farmer education and farm efficiency in Nepal: The role of schooling, extension services, and cognitive skills. World Development 12(1): 67–86.

Katungi EM (2007). "Social Capital and Technology Adoption on Small Farms: The Case of

Key N, Mcbride W (2003). Production Contracts and Productivity in the U.S. Hog sector. American Journal of Agricultural Economics, 85 (1): 121-133.

Kwara State Government Diary,(2006): KWSG 2006 Annual Report

Lawal JO, Omonona BT, Ajani OIY, Oni OA (2009). "Effects of Social Capital on Credit Access Among Cocoa Farming Households in Osun State, Nigeria. Agricultural Journal 4.4: 184-191

Liverpool SLO, Winter-Nelson A (2010). Poverty status and the impact of social networks on smallholder technology adoption in rural Ethiopia. IFPRI Discussion Paper 970. Washington D.C.: IFPRI

Liverpool-T LS, Kuku O, Ajibola A (2011). A review of literature on agricultural productivity, social capital and food security in Nigeria. International Food Policy Research Institute, Nigeria Strategy Support Program. NSSP Working Paper No. 21, October

Muhammad-Lawal A, Omotesho OA, Oyedemi FA (2013). An assessment of the economics of cassava processing in Kwara State, Nigeria. Invited paper presented at the 4th International Conference of the African Association of Agricultural Economists, September 22-25, 2013, Hammamet, Tunisia

National Population Commission (NPC) (2006). Population Distribution by Age and Sex (State and Local Government Area). Priority Table (Vol. IV, p. 263).

Odebode SO, Adetunji TA (2010). Social Capital and Banana/Plantain Production for Income Generation in Osun State: Rural Dwellers Experience Journal of Agricultural Extension Vol. 14 (2), 138-150

Okunmadewa FY, Yusuf SA, Omonona BT (2005). Social capital and poverty in Nigeria. Draft Final Report Submitted to African Economic Research Consortium (AERC) Kenya.

Oni O, Pender J, Phillips D, Kato E (2009). Trends and Drivers Of Agricultural Productivity In Nigeria. Nigeria Strategy Support Program (NSSP) Report 001: IFPRI

PhD Thesis, Department of Agricultural Economics, University of Ibadan, Ibadan

study in Cooperative and Non-cooperative farms in Oyo and Kwara States, Nigeria". Unpublished Ph.D Thesis, University of Ibadan

Van den Broeck K, Dercon S (2007). Social Interactions in Growing Bananas: Evidence from a Tanzanian Village CSAE WPS/2007-05

Yusuf SA (2008). "Social Capital and Household Welfare in Kwara State, Nigeria". Journal of Human Ecology; 23.3: 219-229.