ASSESMENT OF SAVING AND INVESTMENT CAPACITY OF SMALL-SCALE TOMATO FARMERS IN JIGAWA STATE, NIGERIA

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ABSTRACT
The root to economic growth lies in the ability of the entrepreneur to save and invest. This study was conducted to assess the saving and investment capacity among small-scale tomato farmers in Jigawa State of Nigeria. Multi-stage sampling technique was used to select 180 small-scale tomato farmers who were interviewed using structured questionnaires. Data generated from the study was subjected to descriptive statistics, logistic regression analysis and factor analysis. Results showed that 97.2% of the farmers were males with a mean age of 48 years and mean household size of 12 persons with tomato farming alone as the major source of income of the farmers. Average propensity to save was found to be 18%. Logistic regression analysis revealed that educational status, income and membership of association of the farmers had significant (p<0.05) influence on farmers saving capacity. Major constraints to saving and investment capacity include risk of capital lost, high expenditure on consumption and social obligation, poor access to credit, lack of banks branches, and high administrative cost of saving institutions. It is therefore recommended that, farmers should be encouraged to diversify their economic activities to earn more income to be able to increase their saving so as to cover their expenditure on consumption and social obligation. There is need to encourage farmers to participate in insurance scheme so as to cover the fear of capital loss.
Key words *Saving capacity, Tomato farmers, Economic diversification, Investment capacity*

INTRODUCTION

Tomato (*Lycopersicon lycopersicum (L) Kerst*) is one of the most widely grown vegetable crops in the world. It is also one of the major vegetable cash crops produced in Nigeria. According to Tambo and Gbemu (2010) tomato is an important food component consumed in Nigeria and this is apparent in the fact that most Nigerian dishes have tomatoes as an ingredient. Tomato production is a source of income to farmers and all other economic agents involved in its production and marketing. So it is an important vegetable cash crop, which generates income for the upkeep of the farming family. Most of the tomatoes produced in Nigeria come from small-scale farms where the major tools applied are the traditional cutlass and hoe which has been blamed for the low level of production (Orefi, 2011). Most of these tomato farmers have limited access to resources especially improved inputs, a factor that limits their productivity, level of investment, saving and income.

The saving and investment of small-scale farming sector is of utmost importance to the Nigerian economy. This is because of the income generated and the employment potential, instructive in them which set limits of the sector to the growth of the other sectors of the economy. Over the years many small-scale farmers in Nigeria have increasingly became unable to finance their farming activities. These farmers according to Babatunde *et al.* (2007) are characterized by their engulfment in vicious cycle of poverty due to low productivity, low income, low savings, and low

investment. It was further observed that this vicious cycle in the rural areas has been identified as one of the major factors impeding rapid economic development. Past effort at overcoming these problems were traced to lack of substantial savings and easy access to credit facilities by farmers due to inadequate and inappropriate choice of a savings and investment plan. Odemenem *et al.* (2013) reported that one of the basic problems confronting the development of Agricultural sector in Nigeria could be attributed to inadequate savings and investment by the small-scale farmers. Despite this problem, policy makers have not really drawn up adequate and comprehensive rural saving scheme that will progressively encourage the farmers to invest their capital efficiently (Ogwanighie, 1997). A lot of research has been carried out on saving and investment potentials of rural households in Nigeria but despite the quantum of researches in this area of study, there seems to exist dearth of empirical knowledge of the study in Jigawa State. Again, judging from the traditional view on the saving and investment behaviour that small scale rural farmers neither save nor invest because they have low productivity as they confined to traditional methods of farming which seems unjustifiable in Jigawa state. Therefore, this study intends to provide reasons for dissaving and possible reasons for saving and investment where they occur. Also, establish the determinants of the desire to save and investment at household utility level. The purpose of the study was therefore, to assess saving and investment capacity of small-holder farmers. Specifically, the study described the socio-economic characteristics of farming households; described the income, saving and investment level of the farmers, analyzed the factors that influenced savings behaviour among small scale tomato farmers and analyzed constraints to savings and investment among the farming households.

MATERIALS AND METHOD
Study area
The study was carried out in Auyo and Kazaure LGA of Jigawa State, Nigeria. The Area has a population of 4,348,649 people (NPC, 2006) while the estimated population in 2014 was 5,372,754 at 2.9% rate of population growth. Out of the 5,372,754 people, about 90% of the population are predominantly engaged in rural and subsistence farming. Many of the citizens are involved in production of crop such as millet, sorghum, groundnut, tomatoes etc. The Area economy is largely characterised by informal sector activities with agriculture as the major economic activity.

Sampling Procedure
The sample for the study was drawn using multi stage sampling. In the first stage, purposive selection of zone 3 and 4 from the four agricultural zones (Zone 1, 2, 3 and 4) of the State was made base on the high concentration of tomato production in the zone. The second stage also involved purposive selection of one Local Government Areas (LGA) within each zone based on high concentration of small-scale tomato farmers. Auyo and Kazaure were identified. Third Stage involved random selection of three villages from each of the selected LGAs. The villages selected were Arawa, Ganuwar kuka, Gatafa in Auyo LGA and Gada, Gumuma, Wawan rafi in Kazaure LGA. The final stage was a random sampling of 50% of the estimated population of the farmers from each of the selected villages to make up a total sample size of one hundred and eighty (180) respondents.

Analytical tools
Descriptive statistic including frequency, means and percentage was used to describe the socio economic characteristic of the famers. Logistic regression was used to determine the socio-economic factors that influence farmer's attitudes to save in the study area and also factor analysis

was used to determine the factors that militate against saving and investment of small- scale tomato farmers in the study area.

Logit Regression Model

$$Sav = \beta_0 + \beta_1 Age + \beta_2 Edu + \beta_3 HHZ + \beta_4 Income + \beta_5 Mberass + U \dots (2)$$

Where

Sav= (sav =1 if farmer saved, 0 if other wise)

β_0= Constant

$\beta_1. \beta_5$ = the coefficient of explanatory variables

Age = (Years)

Edu= Education Status (Years)

HHZ= Household size (Number)

Income = Income level (Naira)

Mbrass= Membership of association (Member =1 , 0 otherwise)

U = Error terms

Factor analysis

Factor analysis is a generic name used to describe a number of techniques that are used to decompose a correlation matrix when strong assumptions are made about the nature of variation in the variables of the data set (Farinde and Alabi, 2015). Factor analysis is applicable when there is a systematic interdependence among a set of observed variables (Kothari, 2003). This technique allows the researcher to group variables into factors (based on correlation between variables), the meaning and name of such new variable is subjectively determined by the researcher. The principal factoring with iterations and the orthogonal rotation method with Varimax solution adopted by Nwibo and Mbam (2013) were used. The Kaiser rule of thumb of 0.4 as a minimum point factor can be accepted as used by Ashly and Anthony (2006), Nwibo and Mbam (2013). This rule according to Vincent (1997), as cited by Oloruntoba (2002) state that the number of factor retained should be equal to the number of Egenvalues which are equal to or greater than one. However, all factors having an Egenvalues of one or more will be retained as used by Olurontoba (2002), Nwimbo and Mbam (2013).

The model is generally specified as follows:

$X_{1, i} = \ell_1 F_1 + \ell_{1,2} F_2 + \ell_{1,3} F_3 + \dots + \ell_{1,m} F_m + e_1$..(3)

$X_{2, i} = \ell_2 F_1 + \ell_{2,2} F_2 + \ell_{2,3} F_3 + \dots + \ell_{2,m} F_m + e_2$

$X_{n, i} = \ell_n F_1 + \ell_{n2} F_2 + \ell_{n,3} F_3 + \dots + \ell_{nm} F_m + e_n$

Were

F = unobserved variable (factors)

X = Observed variable

ℓ= factor loading

e = error terms

Results and Discussion

Socio-economic characteristics of small-scale tomato farmers

A socio-economic characteristic analysis indicated that 97.2% of the farmers were males with a mean age of 48 years. Mean household size was 12 persons. Tomato farming alone was the major source of income for the farmers; the average farm size was 2 hectares. This result implied that majority of the farmers fall within the active age that means it could be assumed that they would be rational in making decisions and choices regarding their farm responsibilities. Age classification is relevant to this study in that physical ability and productivity depend on age and this will

influence saving and investment .Classification of family size is relevant to this study in that level of household's income and expenditure depends on the number and type of people in the family who are economically active. This result is in line with findings of Yinusa, (1991) who found an inverse relationship between Savings and the Household size in a study of housed hold size in Kaduna State. With respect to saving and investment this finding could mean that there was less saving and investment because the average dependency ratio is high and positive (0.67). It can be assumed that food expenditure and non-food expenditure increase with increase in household size and this could reduce the saving and investment capacity of the farmers. This is supported by Haruna (2011) who reported that high dependency ratios or many dependents indicate more consumption expenditure and hence less saving.

Table 1: Socio economic characteristic of the tomato farmers

Variables	Frequency	Percentage	Mean
Gender			
Male	175	97.2	
Female	5	2.8	
Educational Status			
Qur'anic	73	40.6	
Primary	56	31.1	
Secondary	45	25.0	
Tertiary	3	1.7	
Adult Education	3	1.7	
Age (Yrs)			
25-37	23	12.8	48
38-49	86	47.8	
50-61	57	31.7	
62-73	9	5.0	
74-85	5	2.8	
Household size (no.)			
02-10	81	45.0	12
11-18	89	49.4	
19-26	7	3.9	
27-34	2	1.1	
35-42	1	0.6	
Number of Dependent(no.)			
01-05	59	32.8	8
6-10	100	55.6	
11-15	16	8.9	
16-20	2	1.0	
21-25	3	1.7	
3.26-4.00	3	1.7	
Farm Size (Ha.)			
0.25-1.00	60	33.3	2
1.01 -1.75	1	0.6	
1.76-2.50	97	53.9	
2.51-3.25	19	10.6	

3.26-4.00	3	1.7
Main Occupation		
Tomato/ public servant	32	17.8
Tomato farming alone	83	46.1
Tomato / Arable crop farming	13	7.2
Tomato/fish farming	23	12.8
Tomato/ Livestock rearing	14	7.8
Tomato/ Commodity marketing	7	3.9
Tomato farming/Agro processing	8	4.4
Membership of Association		
Member	96	53.3
Non- member	84	46.7
Total	**180**	**100**

Source: Survey Data (2015)   n = (180)

Saving, income and investment level of the Small scale tomato farmers
The result for income distribution of the small-scale tomato farmers is presented in Table 2.The sum of average income of the farmers from both farm and off farm income were ₦254,971 and ₦54,141.92 respectively. Considering the categories of their source of income this result further showed that tomato farmers with tomato/arable crop farming had the higher average farm income (₦215518.19). The implication of this finding is that income from farm may likely affect their savings rate and investment in profitable ventures or farms if properly manage. This result is in conformity with the findings of Nayak (2013) who reported that rural families earn their livelihood from agriculture, petty trading and daily wage working. The average annual saving by the small-scale tomato farmers was ₦55935.47. The result further showed the saving by various categories of the farmers. Tomato farmers that involve themselves in tomato farming/ fishing have the highest average saving (₦83819.49). The average saving of farmers is low if compared with the finding of Jalo (2015) who reported that average saving of cooperative farmers in Adamawa State is ₦210000.The result goes in line with finding of Osaka (2006) in his analysis of saving and investment behaviour of farmers in Kaduna State. The implication is that the saving capacity of the respondent in the study area is low. This may be due to the socio economic characteristic of the respondent among others. These agreed with report from Mora (1994) that the small-holder farmers are characterised by their engulfment in vicious cycle of poverty due to low productivity, low income, low savings, and low investment. The average propensity to save was 0.18 implying that 18% of the total income was saved while 82% of their income were either consumed or invested. This result shows that there is propensity to save in the study area.

The analysis of the investment pattern of the tomato farmers as presented in Table 3 showed that about 68.3% and 48.3% of the farmers invested in livestock and supporting crop production respectively. Investment in non-agricultural sector was found to be 42.2% while investment in farm input is 8.9%. The reason given for the high proportion of investment in livestock production is the availability of space, Agricultural bye-products and proximity with Agricultural farmlands by the farmers which motivate them to kept livestock either as a means of hedging against unforeseen circumstances or a planned saving strategy of earning a lump sum of income. Investment in purchase of Agricultural land and farm equipment (water pump, hose and plough) are the only capital investment by these farmers. The low proportion of these investment may be

attributed to their level of operation which is very low, they are mostly cultivating in small area of land. Also investment in those aspects is expensive and most of them cannot possibly afford the equipment and since they are not frequently purchase and their benefits are spread across different production season. The implication of this finding is that Investment in this study area conforms to investment pattern of peasant farmers which is purchase of livestock and supporting production of other crop which would possibly increase their volume of saving and consequently their investment capacity.

Table 2. Saving and Income Level of smallholder tomato farmers

Source of Income	Average Farm Income (₦)	Average off farm Income(₦)	Average Saving(₦)	Average Propensity to Save (APS)
Farming/ public servant	61927.27	129318.18	51584.25	0.27
Tomato farming alone	168518.17	0	49518.23	0.29
Tomato / Arable crop farming	215518.17	0	63811.32	0.30
Tomato/fish farming	313515.17	90356.31	83819.41	0.38
Tomato/ Livestock rearing	133561.50	42500.0	56915.31	0.32
Tomato/ Commodity marketing	83519.60	56818.94	45318.56	0.32
Tomato farming/Agro processing	803519.60	60000.00	40581.20	0.28
Total Average	1780079.48	378993.43	391548.28	0.18

Source: Survey Data (2015)

Table 3: Investment pattern of small-scale tomato farmers

Areas of Investment	Frequency	Percentage
Livestock production	123	68.3
Farm equipment	43	23.8
Agricultural land	9	5.0
Farm Inputs	16	8.9
Non-agricultural sector	76	42.2
Growing other crop	87	48.3

Source: Survey Data (2015)   (n=180)* Multiple responses recorded

Socio-economic factors influencing saving attitude among small-scale tomato farmer
The logistic regression in Table4 established the link between tomato farmers' socioeconomic characteristic and saving attitude in the study area. The variables included in the model were age, educational status, household size, farmer's monthly income and membership of association. The result of logistic regression as shown in Table 2 indicated that the R^2 Cox and Snell and R^2 Nagelkere were0.252 and 0.341 respectively which signified that 25.2% and 34.1% variance observed in the model is attributable to the independent variables. The fitness of the model was further confirmed by the chi-square (x^2) value of 52.2 with which was significant at 1% probability level. However, the result in Table 4 revealed that educational status, income and membership of association of the farmers were significant at 5% level of probability. The Educational level influenced saving practice implying that having any form of education accounts for ability to

manage their finance, because an educated person is more enlightened, easily adopt new ideas, manage resource and hence could be a better producer. This is in conformity with view of Adeyemo and Bamire, (2005) who ascertained that educational status improved quality of labour and has positive influence on saving and investment decision for improve production and increased income.

The income of the farmers influenced saving practice decision thus showing that income has a direct and positive impact on saving practice decision. This positive relationship between income and saving attitude meant that availability of income enhanced farmers' ability to save and invest. This is in line with the view of Panickar (1992) that the ability to save depends on the level of income other things being the same. Membership of association also influenced saving attitude. This implies that being in any group or association will enhance farmer's attitude to save because one of the important economic obligations of members of association or cooperative society is saving. Most farmers join cooperative society or association in order to be able to Pool their resource together as savings and also to obtain needed inputs (Babatunde *et al*., 2007).

Table 4: Socio-economic Factors influencing saving behaviour

Independent variables	B	S.E	Wald	DF	Sig	Exp(B)
Age(years)	0.495	0.665	0.555	1	0.456	1.641
Educational Status	1.034	0.389	7.051	1	0.008s	2.812
Household size	0.483	0.752	0.412	1	0.521	1.620
Income	0.859	0.385	4.972	1	0.026s	2.361
Membership of association	1.240	0.406	9.332	1	0.002s	3.455
Constant	-2.015	0.736	7.497	1	0.006s	0.133

Source: Survey Data (2015)　　　n=180　　　　　　s=Significant
X^2 = 52.191　df = 5　R^2 Cox and snell= 0.252　R^2 Nagelkere= 0.341

Constraints of saving and investment capacity

In order to determine the Constraint of saving and investment capacity of small scale tomato farmers in the study area, factor analysis was used. The principal factoring with iterations and the orthogonal rotation method with varimax solution adopted by Oloruntoba (2012) and Nwibo (2013) was used. A saturation level or cut-off of 0.4 as used by Nwibo (2013) was set for the study. The Kaiser Rule- of- thumb for final factor identification was also used. This rule according to Vincent (1971) states that the number of factors retained should be equal to the number of Eigen values. This value must be equal to or greater than one. In Table 5, it was observed that out of 13 variables (possible problems), 11 variables have loading of >0.4 while the remaining 2 variables failed to meet the cut-off level (0.4) set for the study. The underlying constraint militating against saving and investment capacity are grouped under four (4) factors. The factors are financial, administrative, specific personal and social Factor.

Based on the factor loading shown in Table 5 the following financial factors were extracted. Risk of capital lost (0.95), High consumption expenditure (0.93), High expenditure on social obligation (0.95) and poor access to credit (0.84) these are the major financial constraint that affect saving and investment capacity in the study area. This result implies that farmers in the study area still have the traditional old perception that, their money is not safe when saved in both formal and informal forms. The reason is the fear that people may abscond with the money saved, Thieves may enter their homes and steal their savings, Bank collapse, liquidation, and also the fear of generating low return from farm are other reasons. Farming was still not viewed as a business in

the study area by farmers since farms operated as business should be capable of generating sufficient revenue for the farm and the farming family. The finding agree with the finding of Osaka (2006) who observed that due to the peasantry nature of the rural farmers of northern Nigeria the returns to farming was low thus, contributing to the low savings and investment habit. Again, Yarron *et al.* (2007) reported that low saving and low investment of farmers are as a result of high marginal propensity to consume. The result equally reveal that the administrative constraint to saving capacity of tomato farmers base on Kaser loading were lack of Banks branches (0.53) and high administrative cost by saving institutions has greatly been a bane for farmers to save. Non availability of banking institute in the study area made it difficult for farmers to have access to banks and also it will be difficult to farmer to travel far distances to save the money in organised financial institution. The other major constraint identified is specific personal status constraint, the saving and investment capacity of the farmers were constraint by low literacy level (0.601), poor market outlet (0.831) and lack of agent for collection. The low literacy level of the farmers as justified from this and the earlier findings on their socio economic status indicated that this education status has negatively shaped the saving and investment habit of the respondent. Social constraint, the saving and investment were constraint by inadequate information (0.93) and high input cost (0.480).

Table 5: Varimax Rotated Factors Matrix on Constraints to saving and investment capacity of small-scale tomato farmers in Jigawa State.

S/N	Variables	Factor 1 Financial Constraint	Factor 2 Administrative Constraint	Factor3 Specific personal Status Constraint	Factor4 Social Constraint
1	Risk of capital lost	0.950	-0.109	0.108	-0.051
2	High consumption expenditure	0.933	-0.025	0.122	-0.003
3	High expenditure on social obligation	0.954	-0.023	0.088	0.008
4	Low literacy level	0.244	-0.007	0.601	0.079
5	Poor market outlet	0.028	-0.008	0.831	-0.102
6	Lack of Agent for collection	0.150	-0.059	0.875	-0.117
7	Lack of bank branches	0.584	0.698	0.094	0.131
8	High administrative cost	-0.136	0.926	-0.098	-0.099
9	Inadequate information	-0.162	-0.039	-0.059	0.932
10	Poor access to credit	0.808	-0.033	0.088	-0.230
11	High Input cost	-0.747	0.098	-0.108	0.480

Source: Survey Data (2015)

CONCLUSION AND RECOMENDATIONS
The study revealed that most of the farmers had informal education, majority were male. Tomato farming alone is the main occupation. The educational status, monthly income and membership of association of the farmers positively influenced farmers' saving attitude. Major constraint militating against saving and investment capacity of the farmers include risk of capital lost, high expenditure on consumption and social obligation, poor access to credit and lack of banks branches. To overcome these observed constraints, farmers should be encouraged to diversify their economic activities to earn more income to be able to increase their saving, cover their expenditure on consumption and social obligation. There is need to mitigate farmers through insurance scheme so as to cover the fear of capital lost. Private lending institution should be encouraged to open in rural areas of the State or creating mobile banking programme so as to render their mandate to

farmers in order to break the problem of lack of bank branches and lack of agent for collection in the study area.

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