

FACTORS INFLUENCING THE SAVINGS AND INVESTMENTS OF POTATO (*Solanum tuberosum*) FARMERS IN MANGU AND BOKKOS LGAs OF PLATEAU STATE, NERIA

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ABSTRACT

The study analysed the savings and investments patterns of potato farmers in Mangu and Bokkos Local government Areas of Plateau State. A multi stage sampling technique was employed to select 168 potato farmers. Primary data were collected through structured questionnaire and analysed using descriptive statistics and multiple regression models. The result revealed that majority (61%) of the potato farmers were in the age group of 31 – 50 years with the mean age of 42 years, 82 % were male and 61% had household size between 6-10 persons. Most (84%) of the potato farmers were married. The result further revealed that 52% of the farmers earn less than N500, 000 while the average income in the study areas was N603, 202 per annum. The regression analysis revealed that annual income and years of experience significantly influenced savings at ($p < 0.01$), farm size and membership of cooperative were significant at ($p < 0.05$). Also, the factors that significantly influenced investment were years of experience ($p < 0.01$), income from potato and off farm activities ($p < 0.05$). The constraints of savings faced by the potato farmers were low income (86.3%) and low interest paid by the bank (58%) while constraints of investment were inadequate capital (90.5%) and high cost of inputs at 82.1%. It was concluded that the factors influencing savings in the study area were annual income, years of experience, farm size and membership of cooperatives while factors influencing investments were years of experience, income from potato and off farm activities. It was recommended that potato farmers should be trained on the importance of savings and investments and also form formidable cooperatives.

INTRODUCTION

Agriculture in Nigeria is practiced at subsistent level and is characterized by numerous farmers operating several scattered small and fragmented plots of land using traditional methods such as land rotation, bush burning and crude implements (Odoemenet *et al.*, 2013). Poor people in developing countries are less privileged and lacked access to formal financial services, a situation that hinders them from contributing immensely to the economic growth of their countries (Odeyet *et al.*, 2017). They depend entirely on farming and farming activities for survival and generation of income, or depend on other non-farming activities to supplement their main sources of income. Most farmers have limited resources, a factor that limits their productivity, investment, savings and income. In the midst of these, farmers have devised a number of options to enhance their farm production activities, increase household income and improve their well-being. One of these options includes

pooling their individual limited resources in order to work together as members of a cooperative society (Odoemenet *et al.*, 2013).

Savings are of great importance in a developing economy like Nigeria. This is because of the direct bearing it has on the level of economic activity of the nation (Odeyet *et al.*, 2017). Similarly, within the agricultural sector, the degree of progress attained will largely depend upon what the farmers do with the additional incomes generated from year to year from their farm activities.

Ojiegbe, Duranchi and Makwe (2016), found out that there is long relationship between saving, investment and economic growth in Nigeria. This means that the ability, willingness and opportunity of farmers to save and invest over time can significantly influence the rate of capital accumulation and economic growth in developing

countries like Nigeria (Oluwakemi, 2012).

Adequate integration of saving and investment programmes into development strategies is capable of improving resource allocation, promoting equitable distribution of income, and reducing credit delivery and recovery costs. Cooperatives serve as useful instruments for marketing farmers' produce and as avenues for saving and credit facilities as these informal financial institutions are mostly preferred by farmers due to easy accessibility, smallness of scale, and informal nature of transactions (Adeyemo and Akala, 2014).

The importance of the study is to underscore the lack of empirical work on the factors influencing savings and investment behaviour of potato farmers in the study area. This study, therefore, intends to reduce the gap in knowledge in this regard as it attempts to provide detailed empirical findings. The relevance of the study lies in its attempt to contribute to the information base necessary for objective decision-making.

In the light of the above, the study seeks to answer the following research questions:

- I. What are the socio economic characteristics of potato farmers in the study area?
- ii. What are the factors that influence the level of savings and investment by potato farmers in the study area?
- iii. What are the constraints associated with savings in the study area?

Objectives of the Study

The broad objective of the study is to determine the factors that influence savings and investments of potato farmers in the study area. The specific objectives are to:

- I. Describe the socioeconomic characteristics of the respondents in the study area;
- ii. Determine the factors that influence savings and investments of potato farmers;
- iii. Describe the constraints of savings faced by the respondents in the study area.

METHODOLOGY

The Study Area

The study was conducted in Mangu and Bokokos LGAs of Plateau State, Nigeria. Plateau State is located in the middle belt region of the country. The high relief and the climate of the State is ideal for Irish potato production as well as vegetables, fruits and other exotic crops (Plateau State Wikipedia).

Mangu Local Government Area is located in the central part of Plateau state, Nigeria. Its headquarters is located in the town of Mangu. The area lies between 9° 11' and 9° 15' E of the Greenwich meridian and Longitudes 9°47' and 9° 49'N of the equator (Plateau State Wikipedia). Mangu LGA has 8 districts and 36 villages with a total area of 1,578 km² and population projection of 294,931 (NPC of Nigeria, 2006, National Bureau of Statistics, 2017). The climate of Mangu LGA in the wet season is most suitable working on the farm, the rains starts in off in April and the weather generally gets cold after the rains and sometimes very warm when the sun is up and the sky clear.

Languages spoken are mostly Mwaghavul and Pyen with minor languages of Chakfem, Jipal, Mupun, Berom, Bijin and Rumuda. The people of Mangu LGA are mostly farmers who produce food crops such as; maize, potatoes, beans, acha, millet, palm oil, tomatoes, pepper, cabbage, carrots, rearing of livestock. Mangu LGA has an average temperature of 22 °C, average annual rainfall of 1626mm, and it is 1300 – 1400 meters above sea level (<https://en.climate-data.org>).

Bokkos also a local government in Plateau State with its headquarters in the town of Bokkos. The area lies between latitude 9° 00' and 9° 02' E of the Greenwich meridian and Longitude 9° 15' and 9° 18'N of the equator (Plateau State Wikipedia). Bokkos LGA has 8 Districts and 32 villages with a total area of 1,682 km² and a population projection of 178,454 (NPC of Nigeria (2006), National Bureau of Statistics, 2017).

The average temperature of Bokkos LGA is 21.4 °C, it is 1200-1300 meters above sea level and has an average annual rainfall of 1314mm (<https://en.climate-data.org>). Crops grown include

potato, acha (*Digitariaexilit*), ocoyam, maize, oil palm, bananas, black benni seeds, olive trees (*atili*), sugar cane, vegetables and rearing of livestock. The Languages spoken by most people are Ron, Kulere, Mushere and other minor ethnic groups (www.plateaustate.gov.ng 2019).

Sampling Technique

A multi-stage sampling technique was used in the selection of the respondents. The selection of the two LGAs was purposive due to their high participation in Irish potato production (Jwanyaet al., 2014). The second stage was a purposive sampling of 2 districts from each of the 2 LGAs, giving a total of 4 districts. The third stage was a random sampling of 12 communities from the 4 districts selected in the second stage. Finally a random sampling was conducted to select the sample size of 168 respondents (10 % of sample frame) based on the 1668 (sample frame).

Data Collection

Structured questionnaire was used to collect the data via one on one interview with the respondents in the study area. This was achieved by trained enumerators with strict adherence to ethics of quality data collection.

Analytical Technique

Descriptive statistics such as frequencies, means, tables and percentages was used to achieve objectives i and 3 while multiple regression model was used to achieve objective ii.

Normality test

Normality test is used to determine whether sample has been drawn from a normally distributed sample. To test if the data is normally distributed, P-P plot was employed. The P-P plot is constructed using the theoretical cumulative distribution function (cdf), $F(x)$, of the specified model. In case of standard normal distribution $F(x)$ is usually denoted as $\Phi(x)$. The idea is to plot the theoretical cdf against the sample (adjusted) cdf. Let the $X_1, X_2, \dots, X_n$ be random sample from a population which we 'feel' may be normally distributed. As a preliminary

check we may obtain a P-P plot with a normal distribution. For this purpose, we first order the values in the data set from smallest to largest, and denote them as $X_{(1)}, X_{(2)}, \dots, X_{(n)}$ where $X_{(i)}$ for $i=1, 2, \dots, n$. $\Phi\left[\frac{X_{(i)} - \mu}{\sigma}\right]$ was plotted against $(i-0.5)/n$ where were the estimated mean and standard deviation from the data. If the data come from a normal distribution then the plot should show an approximate straight line.

Model specification

The multiple regression models of the factors influencing farmers' savings and investment was implicitly stated as follows;

$$Y = f(X_1 + X_2 + X_3 \dots \dots + X_{10} + e_i) \dots (I)$$

Savings model: The saving model is explicitly stated as follows;

$$Y = b_0 + b_1X_1 + b_2X_2 + b_3X_3 + \dots + b_{10}X_{10} + e_i \dots (ii)$$

Where;

Y = Amount Saved by potato famer in a year (Naira)

X_1 = Age of the potato farmer (years)

X_2 = Household size (number)

X_3 = Education level (number of years spent in school)

X_4 = Farm size (hectare)

X_5 = Membership of farmers association (Yes = 1, No = 0)

X_6 = Access to credit (Naira)

X_7 = Farming experience (years)

X_8 = total investment (Naira)

X_9 = Annual income (Naira)

X_{10} = income from farm activities (Naira)

e_i = Error term

b_0 = Intercept,

$b_1 - b_{10}$ = Regression parameters to be estimated.

Investment model:

$$Y = b_0 + b_1X_1 + b_2X_2 + b_3X_3 + \dots + b_{10}X_{10} + e_i$$

...(iii)

Where;

Y= Amount invested by the respondents in both farm and off farm activity(Naira)

X₁= Age of the respondents (years)

X₂= Household size (number)

X₃= Income from potato production (Naira)

X₄= Income from other farm activities (Naira)

X₅= Income from off farm activity (Naira)

X₆= Education level (number of years spent in school)

X₇= Farm size (hectare)

X₈= Membership of farmers association (Yes = 1, No = 0)

X₉= Access to credit (Naira)

X₁₀= Farming experience (years)

e_i = Error term

b₀ = Intercept,

b₁–b₁₀= Regression parameters to be estimated.

RESULTS AND DISCUSSION

The result of the findings is presented and discussed in this chapter using tables and figures based on the specific objectives of the study.

Socio Economic Characteristics of Potato Farmers in the Study Area.

The socio economic characteristics of the potato farmers in the study area were considered very important in the study and were therefore presented in table 1.

Age of the potato farmers: Table 1 also showed that, 20% of the respondents fell within the age bracket of 20 - 30 years, 61% were between the ages of 31- 50 years, while 19% were between the ages of 51- 70 years. The mean age of the respondents was 42 years. This clearly indicated that majority (61%) of the respondent fell within

the active and productive age group which is relevant to the study. Physical ability and productivity depends on age and will significantly influence savings and investments

Sex of the respondents: Table 1 revealed that 82% of the respondents were males and only 18% were females, this agrees with the findings of Jwanya et al., (2014) who reported that 84% of potato farmers in plateau were male while 16% were female and further attributed it to the fact that the reason is because men always have right to land as a productive resource than women in most African countries.

Marital status of the respondents: Table 1 further revealed that 84% of the respondents in the study area were married, while 16% were single, 4% were divorced and the remaining 2% were widowed. This agrees with the findings of Ajahet al. (2017) in a study of determinants of savings in Cross –river state who reported that 75% of the farmers were married. The implication of this is that majority of the farmers have dependents on them for domestic expenditure thus have adverse effect on their savings.

House hold size of the respondents: Table 1 further revealed that majority (61%) of the respondents had a household size ranging from 6 – 10 persons, 36% had between 1 - 5 persons, 16% had a house hold size between 16- 20 persons while 2% of the respondent had a house hold size between 11 -15 persons. The mean house hold size was 6 persons. This agrees with Jwanya et al., (2014) who reported that 90% of potato farmers in Plateau State had house hold size between 6 and 10 persons. The implication of this is that the larger the household size the higher the dependency ratio as well as consumption rate which influences savings negatively (Osundare, F.O 2013).

Years of experience in potato farming: The result in table 1 further revealed that 24% of the respondents had 1- 10 years of experience in potato farming, 33% of the respondents had between 11-20 years, 19 % had between 21-30 years, 20% had between 31-40 years while 5% had 41-50 years of experience in potato farming. The mean of years of experience was 18years. Experience in farming is used as a measure of management ability to make farm decision (Babani, 2015). This implies that 44% of the respondents in the study area had more than 20 years of experience in potato farming and could manage their farm well.

Educational level of the respondents: The result in table 1 further revealed that only 10% of the respondents did not have any form of education, This implies that 90% of the respondents had one form of education or the other and it agrees with Ajah et al., (2017) who discovered that 97% of farmers in cross Rivers State had one form of education.

Annual income of the respondents: The result from table 1 also revealed that 52% of the respondents earned less than 500,000 naira as their annual income, while only 3% of the respondents had annual income above 2,000,000 naira. The mean annual income was 603,202 naira. This is in agreement with the findings of Ajah (2017) who posited that 50 % of the farmers in cross Rivers State earned annual income less than 500,000 naira while the remaining 50% earned above 500,000 naira. High income is imperative for saving and investment.

Potato farm size: Table 1 further revealed that higher proportion (92%) of the potato farmers in the study area had potato farm less than 3 hectares which agreed with findings of Jwanya et al. (2014) who reported that land ownership in Plateau state hinders farmers from acquiring larger irrigation farm land.

Table 2 : Distribution of respondents based on socio economic characteristics (n=168)

Variable	Frequency	Percentage	Mean
Age			
20-30	34	20	42
31-40	53	32	
41-50	49	29	
51-60	19	11	
61-70	13	8	
Sex			
Male	138	82	
Female	30	18	
Marital Status			
Single	16	10	
Married	142	84	
Divorced	6	4	
Widowed	4	2	
Household Size			
1-5	61	36	

6-10	102	61	6
11-15	4	2	
16-20	1	1	
Years of Experience in Potato farming			
1-10	41	24	
11-20	55	33	18
21-30	30	19	
31-40	34	20	
41-50	8	5	
Highest Level of Education			
No formal education	17	10	
Primary education	34	20	
Secondary education	58	35	
Annual Income			
100,000-500,000	88	52	
500,001-1,000,000	66	39	603,202
1,000,001-1,500,000	6	4	
1,500,001-2,000,000	3	2	
2,000,000-2,500,000	5	3	
Potato farm size			
0.1-1.0 hectare	35	21	
1.1-2.0 hectares	92	55	1.6
2.1-3.0 hectares	27	16	
3.1- 4.0 hectares	10	6	
4.1-5.0 hectares	3	2	

Source: Field survey (2020)

Factors Influencing Savings of the potato farmers

The regression result in table 2 showed that Farm size was positively related to saving and was significant at 5%, this implies that increase in farm size by one unit will lead to increase in savings of the respondent by 2.214 unit. Annual income was also positively related to savings and is significant at 1%. This also means that one unit increase in income of the potato farmer will lead to increase in saving decision of the farmer by 5.252 unit. This corroborated with the findings of Bime and Mbanasor (2011) who reported that the higher the income, the more revenue the farmer generates

from his produce and hence, the more he is likely to save part of his income.

Being a member of cooperative was positively related with saving decision of the potato farmer and was significant at 5%. This implies that the members of cooperative save more than none members of cooperative in the study area. Total investment was also positively related to saving decision of the potato farmer in the study area and was significant at 10%. This also means that one unit increase in investment will lead to 1.816 units increase in saving decision of the potato farmer. The number of years of experience in potato farming was also positively related to the savings of

Table 2: Factors Influencing Savings of the potato farmers in the Study Area in the last Cropping Season (n=168)

Variables	Coefficients	Standard errors	t-value	Sig
(Constant)	.299	1.499	.200	.842
Age_years	.686	.677	1.014	.312
HH_number	-.125	.658	-.191	.849
Education_year	.348	.616	.564	.573
Farm_size	1.638**	.740	2.214	.028
Coop_member	2.915**	1.263	2.308	.022
Access_loan	5.253	6.455	.814	.417
Total_investment	1.456*	.776	1.877	.062
Annual_income	4.287***	.816	5.252	<.001
Experience in years	33.13***	7.368	4.498	.000
R-square	0.514			
F-ratio	18.746***			

***, **, * = Significant at 1%, 5% and 10% respectively Source: Field survey (2020)

Factors Influencing Investments of the Potato Farmers

The regression result from table 3 revealed that Coefficient of Years of experience was positively related to total investment of the potato farmer and it was significant at 1%. This implies that increase in years of experience of the potato farmer will lead to increase in the level of investment of the potato farmer by 2.959 units. Years of experience implies that farmers were more likely to manage their farm well which enhances productivity and hence more investment. The coefficient of income from potato farming and income from other farm were significant at 5%, this implies that increase in income from potato and other farm influences the investment level of the potato farmer. The coefficient of income from off activity from Table 8

was also significant at 5% and d was positive related to investment. This is in line with the *a priori* expectation that increase in income will increase the saving decisions of the potato farmer.

Member of cooperative coefficient was negatively correlated with investment and was significant at 5% this is not in line with *a priori* expectation but could be due to the activities of the cooperative societies in the study area that were not yet fully enforced. Years of experience coefficient was also positively related to the investment of the potato and was significant at 5%. This implies that increase in unit years of experience in potato farming will lead to increase in investment decision of the potato farmer in the study area

Table 3 Factors Influencing Intents of the potato farmers in the Study Area in the Cropping Season (n=168)

Variables	Coefficients	Standard error	t-value	Sig
(Constant)	-.297**	.146	-2.040	.043
Age _years	.15	.68	.226	.812
House hold number	.133*	.062	2.139	.034
Income _potato	.176**	.089	1.985	.049
Income _other farm	.123*	.065	1.888	.061
Income _ off farm	.175**	.073	2.410	.017
Education _years	-.019	.061	-.317	.752
Farm _size	.049	.082	.594	.554
Coop _member	-.221*	.127	-1.746	.083
Access _loan	1.037	.648	1.600	.112
Experience _years	2.278***	.770	2.959	.004
R- square	0.496			
F- ratio	15.023***			

***, **, * = Significant at 1%, 5% and 10% respectively

Source: Field survey (2020)

Constraints Associated with Savings of Potato Farmers in the Study Area

Table 4 revealed that the highest ranking (1st) constraint of saving in the study area was low income (86.3%) which could be clearly seen from the result in table 1 that majority of the potato farmers in the study area had annual income of less than 500,000 naira. The second in ranking of the constraint of savings was low interest rate paid by the bank (58.3%) which could also be attributed to the fact that higher interest rate attracts saving. The third ranking problem of savings was bank procedure (47.6) which discourages farmers from saving their money in the banks due to low level of education by some of the farmers in the study area and also the drudgery aspect of farming which does not give ample time to endure all the procedures

with the banking system. This causes bottle neck for the farmers who really want to patronise the banking systems.

Inadequate bank (41.7%) and distance of bank from residential area of respondents (36.9%) were also reported as problems of savings in the study area and ranked 4th and 5th amongst the problems, this was so because some of the communities in the study area were rural areas and were not having banks which discourages savings. The farmers reported that distant from the bank tend to incur transport money and time spent on the road to get to the bank, also price fluctuation does not give steady price to allow farmer plan his finance obligation thereby causing discouragement in saving his income.

Table3: Distribution of respondents based on constraints associated with savings (n=168)

Variable	Frequency	Percentage	Ranking
Saving constraints			
Low income	145	86.3	1 st
Low interest paid by the bank	98	58.3	2 nd
Bank procedure	80	47.6	3 rd
Inadequate bank	70	41.7	4 th
Distant of bank to respondents residential area	62	36.9	5 th
Price fluctuation	62	36.9	6 th
Government policy	41	24.4	7 th

Source: Field survey (2020)

CONCLUSION AND RECOMMENDATIONS

Conclusion

Based on the findings of this study it was concluded that annual income and years of experience significantly influenced savings at ($p < 0.01$), farm size and membership of cooperative were significant at ($p < 0.05$). Also the factors that significantly influenced investment were years of experience ($p < 0.01$), income from potato and off farm activities ($p < 0.05$). The constraints of savings faced by the potato farmers were low income (86.3%) and low interest paid by the bank (58%) while constraints of investment were inadequate capital (90.5%) and high cost of inputs (82.1%).

Recommendations

Based on the findings of this study, the following suggestions were made: I. There is need for training on the importance of savings and investment to enhance capacity of potato farmers in the study area.

ii. Financial institutions should be more proactive in granting loans to potato farmers and should be at a reduced interest rate but with proper monitoring.

iii. Farmers should pool their resources together and form formidable cooperatives in order to get an outlet where they can market their potatoes (to prevent spoilage) and at reasonable price.

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