

## Factors Affecting Loan Repayment Performance Among Yam Farmers in the Sene District, Ghana

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### Abstract

The study analyzed the factors that are critical in improving loan repayment by yam farmers in the Sene district of Ghana. Random sampling technique was used to select 100 respondents in the district and structured questionnaire was administered to collect data. Descriptive statistics and the probit model were employed. The results show that 42% of yam farmers in Sene district are illiterates. More males (93%) are involved in yam farming than females (7%) and most of the farmers are married (91%). Also most of the yam farmers in the district have a family size of 6-10 households (66%) and 54% of them have 1-10 years of yam farming experience. Also, the results show that education, experience, profit, age, supervision and off-farm income have positive effects on loan repayment performance. Conversely, gender and marriage have negative effects on loan repayment while the effect of household size was found to be ambiguous.

### Key words

Yam farmers, Loan repayment, Probit model.

### Introduction

Yams (*Dioscorea* species) are a major component of rural people's livelihoods in Ghana. They are an important source of food and income for producers' households and an important food source for both local consumption and export. A survey by German Technical Cooperation (GTZ) of the Northern region of Ghana identified yams as the most important cash and food crop in that region. According to Fowler (2000), yam also received the highest priority ranking of all crops in the National Agricultural Research Strategy Plan (NARSP) and in the Agricultural Services Sector Investment Programme (AgSSIP).

West Africa produces more than 90 per cent of the world's yam output, with Ghana the third most important producer, ranked behind Nigeria and Côte d'Ivoire. Ghana produced 2.2 million tonnes in 1995, compared with 2.8 million tonnes in Côte d'Ivoire and Nigeria's 23 million tonnes (Vernier et al, 1997). The crop is one of Ghana's major staples. Yams are ranked second in importance (in tonnage terms) after cassava in staple food production and, as a result of their relatively high unit price, are the most important food crop in terms

of value of production. Together with cassava, they provide 31 per cent of national food security and supply in excess of 50 per cent of the calorie needs of the average Ghanaian. The crop is grown mainly by smallholders, covering approximately 10 per cent of the country's cultivated land which is approximately one-third of the area planted to cassava (Nkum Associates, 1994).

While cocoa provides 14 per cent of the natural resources sector's GDP, other crops, which include yams, make up 61 per cent (1994 data). More detailed analysis shows that roots and tubers account for 46 per cent (of which cassava: 19 per cent; yams: 17 per cent; and, cocoyams: 10 per cent) and maize for 5 per cent (Anon, 1994). Fisheries (5 per cent), forestry (11 per cent) and livestock (7 per cent), comprise the balance. The importance of yams as a food staple is underlined by the observation that its consumption is sometimes used as a poverty indicator – thus, if *fufu* is prepared only rarely, the household is considered to be poor. Indeed, it is reported that rural households seek to extend the period of tuber storage so that they can eat yams regularly in order to demonstrate to neighbours that they are not poor (Anamoh and Bacho,

1994). In addition, the crop is important to rural households for food security purposes because its yields fluctuate less than those of cassava (Impact Evaluation Consulting Team, 1999). The crop is grown widely in 34 of the country's 43 agricultural districts, although data showing the breakdown of production by region are unfortunately not published regularly (Anon, 1994). The principal areas of production are the northern forest and southern savanna zones, with about two-thirds of the national harvest being produced in Brong Ahafo and Northern regions. The crop is consumed in all parts of the country (GTZ, 1999).

Yams are a prestigious crop having strong cultural, ritual and religious significance and their consumption is preferred to other starchy staples at social gatherings (Dorosh, 1988; GTZ, 1999; IITA, 1998; Orkwor et al, 1998; Tetteh and Saakwa, 1991). They are used, for example, to fulfill social obligations to chiefs and in-laws in the rural areas (Langyintuo, 1993), which is why the production of 'ware yams for daily consumption and sale continues alongside the production of even larger tubers which are used principally for ceremonial purposes. They are also an indispensable part of bride-price. Consequently, yams are likely to remain an important component of the crop mix in Ghana's savanna and northern forest agro-ecological zones for the foreseeable future.

Many financial institutions in developing countries provide financial services such as saving and credit to aid several smallholder enterprises including farmers. This is an effort in line with the Millennium development goals which seeks to reduce poverty by 50% by the year 2015. However, the sustainability and continuity of the financial institutions to increase the volume of credit to stimulate the poverty reduction goal depends on the repayment rates. High repayment rates allow the institutions to lower the interest rates and processing costs and consequently increase patronage of loans. Repayment performance thus serves as a positive signal for increasing the volume of credit availability to various sectors of the economy (Acquah and Addo, 2011). However, the financial institutions continue to decline credit to the agricultural and fisheries sectors. This decline is partly due to poor loan repayment performance from these sectors. Most of the loans default in these sectors could arise from poor management procedures, loans diversion and unwillingness to repay loans as well as other socioeconomic characteristics.

Generally, in spite of the importance of loan in agricultural production, its acquisition and repayment are fraught with a number of problems especially in the small holder farming (Awoke, 2004). Awunyo-Vitor (2012) has reported in empirical studies that large rate of default has been a major problem in agricultural credit delivery and sustainability, consequently large proportion of formal financial institution has suspended agricultural credit. Thus a key issue in the sustainability of agricultural credit delivery hinges on improved loan repayment. It is therefore, important for the financial institutions to devise means to reduce the levels of loan default. This can be achieved if they know the factors that influence loan repayment. The question this study seeks to answer is what factors are critical in improving loan repayment by farmers?

Inability of borrowers to repay amount of loans collected is crucial for the long-term sustenance of the credit institutions. As a result, many studies have tried to examine loan repayment performance of many socio-economic groups. Empirical work by Arene (1993) revealed income, farm size, age of farmers, farming experience and level of education of farmers contributed positively to the credit worthiness of farmers. Oladeebo and Oladeebo (2008) examined the determinants of loan repayment among smallholder farmers in Ogbomoso Agricultural Zone, Nigeria. Results from multiple regression analysis showed that amount of loan obtained by farmers, years of farming experience with credit and level of education were major factors that positively and significantly influenced loan repayment. Eze and Ibekwe (2007) examined the determinants of loan repayment under the indigenous financial system in Southeast Nigeria. Empirical results from multiple regression analysis revealed amount of loan received, age of beneficiary, household size, years of formal education and occupation as important predictors of loan repayment under the system. Mashatola and Darroch (2003) analyzed the factors affecting the loan status and repayment scheme of sugarcane farmers who received graduated mortgage loan in Kwazulu-Natal, South Africa. Results identified farm size (proxied by annual gross turnover), access to off-farm income, and average annual gross turnover relative to loan size as criteria in selecting potential farmers for such scheme as they provided additional liquidity to fund future operations and debt repayment. Okorie (1986) examined the major determinants of agricultural smallholder loan repayment in Ondo State, Nigeria.

Results identified the nature and timeliness of loan disbursement, the number of supervisory visits by credit officers, profitability of the enterprise on which the loan funds were invested as significant factors that stimulate loan repayment. Kohansal and Mansoori (2009) investigated the factors affecting loan repayment performance of farmers in Khorasan- Razavi Province of Iran. Results from a logistic model showed that loan interest rate was the most important factor affecting repayment of agricultural loans. Farming experience, and total application cost were the next factors respectively. Chirwa (1997) analyzed the determinants of credit repayment among smallholder farmers in Malawi using a probit model. Results revealed sales of crops, size of group, degree of diversification, income transfer and the quality of information as significant determinants of agricultural credit repayment. Bassem (2008) examined the factors vulnerable to affect the repayment performance of group lending in Tunisia. Empirical results from a logistic regression estimation showed that the repayment is influenced positively by the internal rules of conduct, the same business, and the knowledge of the other members of the group before its formation, the peer pressure, the self-selection, the sex, the education and the non financial services. However, the homogeneity, and the marital status had a negative influence on repayment.

## **Materials and methods**

### **Study area and data collection**

Sene District is one of the 22 districts in the Brong Ahafo Region of Ghana. It was created out of the Atebubu District in 1988. Kwame Danso is the capital town of the district. Sene District is bounded to the north by the Volta Lake and East by the Gonja District (in the Northern Region), to the east and south-east by the Volta Lake, Krachi West, Krachi East and Jasikan District in the Volta Region, to the south and south-west by Afram Plains and Sekyere East District in the Eastern and Ashanti Region respectively, to the west by Atebubu-Amanten and Pru district of Brong Ahafo Region.

The Sene District is located between longitudes 0°15E and 0°15W, and latitudes 7°N and 8°30N. Out of the 19 administrative districts in the Brong Ahafo Region, Sene has the largest land area which is about 8586.44 km<sup>2</sup>. The distance from the district capital (Kwame Danso) to the regional capital (Sunyani) is about 241km via Nkoranza

and Techiman. According to the 2010 population and housing census, the district has a population of about 118,820 people. It is characterized by two climatic seasons. These are the dry season between November and March and the rainy season between April and October. The favourable climate of the area encourages about 70 percent of the people to engage in farming activities. Farming is the main industry in the area and they specifically major in grain- and tuber-production but yam dominates all other product in the district. Farming in the district is mostly on a small scale.

The study used both primary and secondary data. Primary data, which was mainly cross-sectional, was collected from 100 yam farmers in the four main yam producing communities in the Sene District. These communities include: Kwame Danso, Lemu, Kyeamekrom and Bassa. In each community, 25 yam farmers were selected from lists of members of the existing yam cooperative society using random sampling technique. The main data collection instruments employed in the study were the use of structured questionnaires and interviews. Primary data for the 2011-2012 production seasons was collected. Variables included in the questionnaire were: farmers' age, sex, educational level, marital status, yam farming experience, household, occupation, whether or not farmers have ever applied for a loan, amount of loan given to farmers, whether or not farmers were able to pay for their loans on time, interest on loans given to yam farmers, timeliness of release of loans, farm size and other factors influencing loan repayment by yam farmers in the Sene district. The study also made use of secondary data obtained from the internet, academic journals, Libraries etc. Data was analysed using version 3.1 of the computer based Econometric Views software (E-Views).

### **Analytical framework**

Frequency and percentages were used to describe the socioeconomic characteristics of respondents while the probit regression model was used to analyze the factors influencing loan repayment performance by yam farmers. The yam farmer's ability to pay for his/her loan at the right time is dichotomized, involving two mutually exclusive alternatives. The yam farmer is either able to pay for his/her loan at the right time or not. Models for estimating such phenomena in which the dependent variable is binary have been propounded (Madala, 2005; Asante et al., 2011). The framework for such analysis has its root in the threshold theory of decision making in which a reaction occurs

only after the strength of a stimulus increases beyond the individual's reaction threshold (Hill and Kau, 1981). This implies that every individual when faced with a choice has a reaction threshold influenced by several factors (Asante et al., 2011). This yields a binary dependent variable,  $y_i$  which takes on the values of zero (yam farmer's inability to pay for his/her loan) and one (a yam farmer's ability to pay for his/her loan). The probability of observing a value of one is:

$$P_r(y_i = \frac{1}{x_i\beta_i}) = 1 - F(-x_i\beta_i) \quad (1)$$

where  $F$  is a cumulative distribution function. It is a continuous, strictly increasing function that takes a real value and returns a value which ranges from 0 to 1. Then, it follows that the probability of observing a value of zero is:

$$P_r(y_i = \frac{0}{x_i\beta_i}) = F(-x_i\beta_i) \quad (2)$$

Given such a specification, we determine the parameters for estimating this model using the maximum likelihood estimation approach. The dependent variable is an unobserved latent variable that is linearly related to  $y_i$  by the equation:

$$y_i = \beta_i x_i + u_i \quad (3)$$

Where  $u_i$  is a random disturbance term. The observed dependent variable is determined by whether  $y_i$  exceeds a threshold value or otherwise:

$$y_i = \begin{cases} 1 & \text{if } y_i^* > 0 \\ 0 & \text{if } y_i^* \leq 0 \end{cases} \quad (4)$$

where  $y_i^*$  is the threshold value for  $y_i$  and is assumed to be normally distributed. Common models for estimating such parameters include probit (standard normal), logit (logistic) and tobit (extreme value) (Madala, 2005; Asante et al, 2011).

**The Model**

The study adopted the probit model partly because of its ability to constrain the utility value of the ability to pay for loans variable to lie within 0 and 1, and its ability to resolve the problem of heteroscedasticity. The other advantages of the probit model include believable error term distribution as well as realistic probabilities. Following from Madala (2005) and Asante et al (2011), the probit model adopted for the study is specified as:

$$P_i = P(y_i^* < y_i)$$

$$P_i = P(y_i^* < \beta_0 + \beta_i x_{ji}) = F(y_i) \quad (5)$$

$$P_i = F(y_i) = \frac{1}{\sqrt{2\pi}} \int_{-\infty}^{z_i} e^{-\frac{s^2}{2}} ds$$

where  $P_i$  is the probability that an individual will make a certain choice (ability to pay for loans collected or otherwise);  $s$  is a random variable normally distributed with mean zero and unit variance;  $y_i$  is the dependent variable (ability to pay for loans collected or otherwise);  $y_i^*$  is the threshold value of the dependent variable. To obtain an estimate of the index  $Z_p$ , the inverse of the cumulative normal function is used:

$$y_i = F^{-1}(P_i) = \beta_0 + \beta_i x_i + u_i \quad (6)$$

The parameters  $\beta_0, \beta_1, \beta_2, \beta_3, \dots, \beta_\infty$  of the probit model do not provide direct information about the effect of the changes in the explanatory variables on the probability of a yam farmer being able to pay his loan alone. The relative effect of each explanatory variable on the likelihood that a farmer will be able to repay his or her loan (marginal effect) is given by:

$$\frac{\partial P_i}{\partial x_{ij}} = \beta_{ij} f(Z_i) \quad (7)$$

Where  $P_i$  is the mean dependent variable whose value is given in the probit results as:

$$f(Z_i) = F^{-1}(P_i) \quad (8)$$

$$Z_i = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \dots + \beta_k X_k \quad (9)$$

$f(Z_i)$  = Density function of the standard normal variable and is given by:

$$f(Z_i) = \frac{1}{\sqrt{2\pi}} e^{-\frac{1}{2}Z_i^2} \quad (10)$$

The empirical model is specified as:

$$ATP_i = \beta_0 + \beta_1 AML + \beta_2 FAE + \beta_3 EDU + \beta_4 FSZ + \beta_5 TIME + \beta_6 ACOFI + \beta_7 NSPV + \beta_8 PGF + \beta_9 MAR + \beta_{10} AGE + \beta_{11} SEX + \beta_{12} HOS + u \quad (11)$$

Where

ATP = Whether or not farmer was able to pay his loan (measured as a dummy, 1 for able to pay and 0 for not able to pay for his loan). This is the dependent variable.

AML = Amount of loan obtained by farmers (Gh¢)

FAE = Years of yam farming experience (years).

Borrowers who have been in business for a long time are expected to be more successful with their farming activities because they have more stable sales than those who just started. Thus experience farmers may have higher repayment rates.

EDU = Level of education (measured in years of schooling). Higher educational levels enable borrowers to comprehend more complex information, keep business records, conduct basic cash flow analysis and generally speaking, make the right business decisions. Hence borrowers with higher levels of education may have higher repayment rates.

HOS = Household size (measured in number of members of farm family). There is a possibility of loans diverted to unintended purposes because of many responsibilities resulting from meeting the needs of many members of the family. Hence borrowers with large family sizes may have lower repayment rates.

FSZ = Farm size (measured in acres). Some borrowers may use a higher percentage of the loan in clearing an unreasonably large land area and at the end they suffer getting money to meet the other cultural practices. This results in low yield and hence farmers with large farm sizes may have lower repayment rates.

ACOFI = Access to off farm income (measured as a dummy, 1 for access to off-farm income and 0 for no access to off-farm income). Borrowers with other sources of income may make loan repayment from the proceeds of those jobs. Thus farmers with other sources of income may have higher repayment rates.

TIME = Timeliness of release of loan (measured as a dummy, 1 for loans released at the right time and 0 for loans not released at the right time). Farming activities in the study area is mostly seasonal and rain fed, hence if the loan is not released at the right time yield will be affected and repayment rate may be low.

NSPV = Number of supervisory visits by credit officers (measured in number of days within the production period). Visits by loan officials to borrowers will motivate the farmers to worker harder and make sure the loans given to them are not diverted to unintended purposes. Therefore borrowers who are visited frequently may have higher repayment rates.

PGF = Profit gained from loan (Gh¢). Since profits are additions to principals, borrowers who are able to make substantial profits are expected to have

higher repayment rates.

MAR = Marital status (measured as a dummy, 1 for married and 0 for single). Borrowers who are married may use their loans in meeting the needs of their families; hence borrowers who are single may have higher repayment rates.

AGE = Age of yam farmer (measured in years). It is argued that older borrowers are wiser and more responsible than younger borrowers. On the other hand younger borrowers are argued to be more knowledgeable and more independent. Hence age might have a positive or negative effect on loan repayment rates.

SEX = Gender (measured as a dummy, 1 for male and 0 for female). Females are normally hypothesized to be very discipline when it comes to loans management. Therefore females may have higher repayment rates.

$u_i$  = Error term (which is assumed to have zero mean and constant variance).

## Results and discussions

### Descriptive Analysis

#### Gender distribution of yam farmers

Table 1 below shows the percentage distribution of male and female yam farmers in the Sene District of Ghana. The results show that 93% of the sampled yam farmers in the Sene District are males and 7% are females. The results show that more men are involved in yam farming in the District than women. It also shows that only few females in the district take yam farming as their business and a source of employment.

Sex	Frequency	Percentage (%)
Male	93	93
Female	7	7
Total	100	100

Source: Field Survey data 2012

Table 1: Gender distribution of yam farmers.

The result is in line with those of Ojiako and Ogbukwa (2012) who studied the economic analysis of loan repayment capacity of smallholder cooperative farmers in Yewa North Local Government Area of Ogun State, Nigeria who found out that the ratio of respondents who were men was 91.8% and that of women was 8.2%.

#### Age distribution of yam farmers

According to table 2 below, the results of the study

shows that only few of the yam farmers in the study area (2%) are at most 20 years. This means that only few teenagers are into yam production in the district. Table 2 also indicates that 48% of the farmers are between the ages of 21 and 40. Farmers in this age group constitute the very energetic youth and are likely to work effectively to increase their yields. Table 2 also shows that 43% of the yam farmers in the district are between the ages of 41 and 60. In addition 7% of the farmers are at least 60 years old. The results suggest a promising future for yam production in the Sene district. This compares well with the results of Ojiako and Ogbukwa (2012), who reveals the average age of farmers to be 44.8 years. Also Acquah and Addo (2011) reveals that fishermen in Cape Coast of Ghana have a mean age of 43.04 years with majority of them (40.3%) in the age range of 41-50 years, 22.4% in the age range of 19-30 years and 7.5% in the range of 61-70 years. This result contradicts the growing evidence of ageing farming population in most parts of rural Nigeria as reported by Akpan (2010).

Age Group	Frequency	Percentage (%)
≤ 20	2	2
21-40	48	48
41-60	43	43
≥60	7	7
Total	100	100

Source: Field Survey data 2012

Table 2: Age distribution of yam farmers.

### Educational level of yam farmers

Table 3 summarizes the educational status of yam farmers in the Sene District. The results show that 42% of yam farmers in the Sene District are illiterates. Such farmers did not receive formal education and are likely to have inadequate knowledge of loan acquisition and management, thereby making them unable to repay the loans given to them.

Educational level	Frequency	Percentage (%)
Primary	23	23
JSS/JHS	21	21
SSS/SHS	10	10
Tertiary/Post Secondary	4	4
Illiterate	42	42
Total	100	100

Source: Field Survey data 2012

Table 3: Educational distribution of yam farmers.

23% of yam farmers in the Sene District ended

in the primary school while 21% of them were educated up to the Junior Secondary School (JSS) level. Some yam farmers in the District (10%) had Senior Secondary School (SSS) education while very few of them (4%) got to the Tertiary level. This is in line with the results of Acquah and Addo (2011). They found that fishermen in the Cape Coast Metropolis have on the average 5.79 years of formal education; with majority (43.3%) having obtained basic education. 20.9% of the fishermen have junior high school education, while only 4.5% of them have senior secondary school education. However, 31.3% have no formal education.

### Marital status of yam farmers

Table 4 shows that only a few of the yam farmers in the Sene District (9%) are not married and the remaining (91%) are married. This results show that most of the farmers in the district are married and these married farmers are likely to spend much of their income on their families. Since married farmers are likely to have a larger family size, they will have higher expenses than single farmers. Therefore single farmers are likely to have better repayment ability than married farmers.

Marital Status	Frequency	Percentage (%)
Single	9	9
Married	91	91
Total	100	100

Source: Field Survey data 2012

Table 4: Marital status of yam farmers.

### Family size of yam farmers

The results show that 25% of the yam farmers in the Sene District have a family size of one to five while 66% of them have a family size of six to ten. This shows that a greater percentage of the farmers have large family sizes and this could likely raise their total expenses and negatively affect their loan repayment ability. Only 9% of the yam farmers in the Sene District have a family size of more than ten members (see table 5).

Family Group	Frequency	Percentage
1-5	25	25
1-10	66	66
> 10	9	9
Total	100	100

Source: Field Survey data 2012

Table 5: Family size of yam farmers.

On the other hand, the large sizes of the families could serve as a source of labour which will increase

the output of the yam farmers and hence positively affect the farmer’s ability to repay the loan. This is consistent with the results of Ojiako and Ogbukwa (2012) which showed the average household size of farmers to be 7 persons.

**Farming experience of yam farmers**

Table 6 below shows that 54% of the respondents have 1 to 10 years of experience in yam farming and 46% of them have more than ten (10) years of experience in yam farming. Therefore famers with less experience in yam farming are more than those with high level of experience in the Sene District of Ghana. The low level of farming experience could negatively influence loan repayment abilities of the yam farmers in the district. This corroborates the results of Ojiako and Ogbukwa (2012) who found the average agricultural years of experience of farmers to be 9.1 years. Also Acquah and Addo (2011) revealed the distribution of average years of fishing experience to be 24.21 years, with 35.8% having from 11 to 20 years of experience, 34.3% having from 21 to 30 years of experience, 19.4% having from 31 to 40 years of experience and only 1.5% of the fishermen had from 51 to 60 years of fishing experience.

Years of Experience	Frequency	Percentage (%)
1-10	54	54
> 10	46	46
Total	100	100

Source: Field Survey data 2012

Table 6: Farming Experience of Yam Farmers.

**Yam farmers ability to repay loans**

Table 7 below presents the results of the ability of the farmers to repay for the loans they went for. The results show that 59% of the yam farmers in the Sene District were able to pay for their loans within the stipulated time. This could be attributed to positive factors like access to off farm income, high yield obtained from the farm, high profitability of loan invested, etc. 41% of the farmers were not able to pay for their loans at the right time. This may be due to the effect of some negative factors like large family size, time schedule for repayment and poor yield among others. The above result implies that the number of farmers who were able to pay for their loans is more than those who were unable to pay. This is consistent with the results of Olagunju and Adeyemo (2007) who found a high loan repayment rate of 78.02% in their investigation of the determinants of loan repayment decisions among smallholder farmers

attached to the National Agricultural Cooperative and Rural Development Bank (NACRDB) in Oyo and Ondo States of southwest Nigeria. Ojiako and Ogbukwa (2012) also found that the average amount of loan repaid by respondents was 69.0% of the amount due for payment, which was by far below the 90% repayment rate found elsewhere (Oke et al., 2007).

Response	Frequency	Percentage (%)
Yes	59	59
No	41	41
Total	100	100

Source: Field Survey data 2012

Table 7: Ability of yam farmers to repay their loans.

**Determinants of loan repayment among yam farmers**

From the results in Table 8 below, a likelihood ratio (LR) statistic of 21.78107 with a Chi-squared ( $X^2$ ) distribution at 13 degree of freedom is significant at 10% level. This means that at least one of the explanatory variables in the model has a significant effect on yam farmers ability to pay for their loans and that the explanatory variables jointly influence yam farmers’ ability to pay for their loans.

The coefficient of household size is negatively related to yam farmers’ ability to repay their loans and is highly significant at 1% level. Increasing farmers’ household size by one person decreases the likelihood of been able to repay one’s loan by 0.39%. This means that the smaller the size of the farm family, the higher the probability that yam farmers will be able to repay their loans and vice versa. This could have probably resulted from the fact that large household sizes increased the household head’s domestic responsibilities and thereby constituted leakage to the household’s income stream. As household income depleted, liability of the household increased and there would be greater tendency to divert loans meant for yam production resulting in default in loan repayment. The results corroborate those of Ugbomeh et al. (2008) who in their study of loan repayment performance among women self-help groups in Bayelsa State, Nigeria, found that household size impacted negatively on loan repayment performance of women farmers. They attributed the outcome to the likelihood of women with large household members to divert some of the borrowed fund to unintended purposes for the upkeep of their households. Moreover, Oladeebo and Oladeebo (2008) stated that family size has a negative influence on the loan repayment ability. Also Ojiako

Variable	Coefficient	Std. Error	z-Statistic	Prob.
C	-1.760431	1.918304	-0.917702	0.3588
EDU	0.032534	0.120171***	0.270734	0.0066
FAE	0.004342	0.060146***	0.072195	0.0004
FSZ	0.026662	0.083961	0.317553	0.7508
SEX	-0.463365	1.056406*	-0.438624	0.0609
PGF	1.767525	0.495848***	3.564653	0.0004
AGE	0.069565	0.431602*	0.161179	0.072
HOS	-0.0099	0.105497***	0.093838	0.0002
NSPV	0.625628	0.542161**	-1.153953	0.0485
TIME	0.259276	0.520608	0.498025	0.6185
MAR	-1.373726	0.905465***	1.51715	0.0092
AML	-6.82E-05	0.000315	-0.216269	0.8288
ACOFI	1.249051	1.047271***	1.192672	0.003
LR statistic (13 df)	21.78107	McFadden R-squared	0.160898	
Probability(LR stat)	0.058848			
Obs with Dep=0	41			
Obs with Dep=1	59			

Note: (\*\*\*) Indicates significance at the 1% level. (\*\*) Indicates significance at the 5% level. (\*) indicates significance at the 10% level  
 Source: Field Survey data 2012

Table 8: Probit estimates of factors influencing loan repayment by yam farmers.

and Ogbukwa (2012) shows comparable results that the negative sign of household size implied that repayment capacity decreased with an increase in household size. On the other hand, Afolabi (2008) found a positive relationship between family size and loan repayment and attributed it to theyamfarmers'extensiveutilizationoffamilylabour in the farming activities. The effect of household size on loan repayment is therefore ambiguous. The effect depends on the management of the household.

Profit gain from loan and the years of farming experience are both highly significant at 1% level and are positively related to yam farmers' ability to repay their loans. An increase in the profit gained from the use of the loan by one Ghana cedi will increase the likelihood of been able to repay one's loan by 70.35%. Similarly, increasing yam farming experience by one more year increases the likelihood of a farmer been able to repay his/her loan by 0.17%. This means that the likelihood of the farmer been able to pay for his/her loan will increase when these variables (profit gain from loan and the years of farming experience) increase and vice versa. This confirms the findings of Oladeebo and Oladeebo (2008) in their study of determinants of loan repayment among small-holder farmers in Ogbomosho agricultural zone of Oyo state,

Nigeria. They found a significant positive relationship between loan repayment abilities and profit as well as farming experience. The implication is that farming experience could probably lead to proper utilization of agricultural loans and inputs and this could have a positive effect on the magnitude of farm profit and consequently loan repayment ability would be enhanced.

In addition, access to off farm income is very significant at 1%. Table 9 shows that yam farmers who have access to off farm income are 49.7% more likely to be able to repay their loans than yam farmers who depend solely on their farm income. This variable has a positive coefficient which means that if a farmer has access to off farm income, he or she has a greater probability of been able to repay his or her loan. This is in line with the results of Ojiako and Ogbukwa (2012) who found that the correlation between respondents' engagement in other jobs and their ability to repay their loans were positive and highly significant. The implication is that as the farmer engages in other income generating activities, he/she will not divert loans meant for farming activities to unintended purposes since those activities would be taken care of by off farm income. Also, Mashatola and Darroch (2003) analyzed the factors affecting the loan status and repayment scheme of sugarcane

farmers who received graduated mortgage loan in Kwazulu-Natal, South Africa. Results identified farm size, access to off-farm income, and average annual gross turnover relative to loan size as criteria in selecting potential farmers for such scheme as they provided additional liquidity to fund future operations and debt repayment.

Table 8 also shows that educational level and marital status are highly significant at 1%. While educational level is positively related to yam farmers' ability to repay their loans, marriage is negatively related. Increasing yam farmers' educational level by one year has the effect of increasing the likelihood of a yam farmer been able to repay his/her loan by 1.29%. In the same way, married yam farmers are 54.67% less likely to be able to repay their loans than single yam farmers. This implies that a farmer will likely have greater loan repayment ability when he or she has a higher educational level and vice versa while single farmers will probably have greater loan repayment ability than married farmers. This also confirms the results of Ojiako and Ogbukwa (2012) in which level of education and marital status had equally significant positive and negative correlations respectively. Also, empirical work by Arene (1993) reveals a positive relationship between loan repayment abilities of farmers and age of farmers, farming experience and level of education of farmers. Eze and Ibekwe (2007) examined the determinants of loan repayment under the indigenous financial system in Southeast Nigeria. Empirical results from multiple regression analysis revealed amount of loan received, age of beneficiary, household size, and years of formal education and occupation as important predictors of loan repayment under the system. Finally, Chirwa (1997) also reports a negative relationship between farmers' loan repayment abilities and marital status. The results aforementioned might be due the fact that single farmers have fewer responsibilities than married farmers.

Furthermore, the number of supervisory visits is positively related to yam farmers' ability to repay their loans and is significant at 5% level. Increasing the number of supervisory visits by one day increases the probability of a yam farmer been able to repay his/her loan by 24.9%. This means that the more credit officers visit farmers to supervise how loan is used, the better farmers' repayment abilities and vice versa. This will motivate the farmers to work harder and there will be less likelihood of farmers diverting the loans to unintended purposes. Okorie (1986) also examined the major determinants

of agricultural smallholder loan repayment in Ondo State, Nigeria. Results identified the nature and timeliness of loan disbursement, the number of supervisory visits by credit officers, profitability of the enterprise on which the loan funds were invested as significant factors that stimulate loan repayment.

Gender has a negative coefficient and it is significant at 10% level. Table 9 shows that male yam farmers are 18.4% less likely to be able to repay their loans than female yam farmers. This means that females are more likely to be able to repay their loans better than males. This might be due to the saying that females are more discipline than males and will make sure production resources given to them are used for their intended purposes. The results confirm those of Ojiako and Ogbukwa (2012). Finally, age is also highly significant at 10% and has a positive coefficient. Addition of one more year to a yam farmers' age has the effect of increasing the likelihood of him/her been able to repay his/her loan by 2.77%. It means that older farmers have better loan repayment abilities than young farmers. This could be due to the many years of yam farming experience that these older yam farmers have. Ojiako and Ogbukwa (2012) had similar results.

Variable	Coefficient	Marginal Effects
C	-1.760431	
EDU	0.032534	0.0129485
FAE	0.004342	0.001728
FSZ	0.026662	0.010611
SEX	-0.463365	-0.18442
PGF	1.767525	0.70347
AGE	0.069565	0.027687
HOS	-0.0099	-0.0039402
NSPV	0.625628	0.248999
TIME	0.259276	0.1031918
MAR	-1.373726	-0.546744
AML	-6.82E-05	-0.000027
ACOFI	1.249051	0.4971222
$Z=-0.04591436, f(Z)= 0.398$		

Source: Field Survey data 2012

Table 9: Probit estimates of factors influencing loan repayment by yam farmers.

## Conclusion

The results of the study show that 42% of yam farmers in the Sene district are illiterates and fall within the ages of 21 to 60 (91%). More males (93%) are involved in yam farming than females

(7%) and most of the farmers are married (91%). Also most of the yam farmers in the district have a family size of 6-10 households (66%) and 54% of them have 1-10 years of yam farming experience. The study reveals that 41% of yam farmers in the Sene district were not able to repay their loans. Also, the results show that educational level, number of years of farming experience, profit gained from loan, Age of farmer, supervisory visits to farmers and access to off-farm income have positive effects on yam farmers' ability to repay the loans given to them by financial institutions. A rise in each of these factors will therefore enhance yam farmers' loan repayment abilities. On the other hand, gender and marriage have negative effects on yam farmers' loan repayment abilities. The effect of household size was however found to be ambiguous. The aforementioned factors are therefore critical in improving loan repayment by farmers in the Sene district of the Brong-Ahafo Region.

Based on the results obtained in this study, it is recommended that credit institutions or lending agencies should look out for the factors that significantly influence loan repayment before granting loans to yam farmers to reduce

the incidence of loan defaults. Routine visits by credit officers to farmers will help put farmers on track and monitor the proper use of the loan they acquire. The study also recommends that all farmers should be educated on the importance of having other sources of income apart from their farm so that they can use the loans they acquire for farming activities only. This will help them to have a better output and hence a better repayment capacity. Again, farmers in the Sene district should be encouraged to further their education, practice factors that encourage a higher repayment rate and reduce the factors that prevent them from being able to pay for their loans.

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