

Informal Sources of Financing Climate Change Adaptation amongst Crop Farmers in Nigeria

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The study examined the sources of informal finance in aiding climate change adaptation in South eastern Nigeria. Random sampling was adopted in the selection of 6 out of the 9 communities in the study area. From each of these selected communities, 10 crop farmers were randomly selected giving a total number of 60 respondents. Descriptive statistics such as percentages and frequency, as well as multiple regression analysis were used for data analysis. The socio-economic characteristics showed that the respondents who made use of informal financial sources were predominantly male, and had farming as their primary occupation. The regression results showed that age and level of education of the respondents does not have significant effect on the amount of informal finance. Whereas, gender, marital status; farming experience; and annual farming income have a significant effect on secured amount of informal finance. Inadequacy of the informal lenders, insufficiency of the credit, poor accounting knowledge of money lenders, inconsistency and unreliability of the informal credit are the main constraints of informal finance in the study area and hence negatively influence the adaptation measures on climate change.

Keywords: Informal Finance, Crop Farmers, Climate Change Adaptation, Southeastern Nigeria

1. Introduction

Climate change is one of the most serious environmental threats facing agriculture. It has been defined by the IPCC (2001) as statistically significant variations in climate that persist for an extended period, typically decades or longer. It upsets seasonal cycles and disrupts the ecosystem. As the planet warms, rainfall patterns shift and extreme events such as droughts, floods and forest fires become more frequent, which result in poor and unpredictable yields (Zoellick, 2009).

It is projected that crop yield in Nigeria may fall by 10-20% by 2050 due to climate change (Enete & Amusa, 2010), particularly because Nigerian agriculture is predominantly rain-fed and hence fundamentally dependent on the vagaries of weather. The above therefore necessitates the need for climate change adaptation- which refers to measures taken to successfully manage and adjust to the effects of climate change (IPCC, 2007).

However, according to Ihemezie (2012), adaptation measures have cost implications on farmers who are the most vulnerable group because of their poor financial base. Though climate change is

a global phenomenon, its effects are locally felt and can be addressed locally using locally relevant measures such as informal finance. Adaptation to climate change is to help the most vulnerable social groups, then it must be highly local and its effectiveness depends on local funding through which incentives for individuals and collective actions are structured (Agrawal, 2008).

Informal finance can be defined as indigenous or non-institutional sources of finance available to rural farmers in a community which includes personal savings, friends, relatives, merchant traders, money lenders and "Isusu" type organizations (Ukaegbu, 1985). Informal finance is seen as an important input for small farmers to access new technologies so as to improve their production. Informal finance could be in form of cash or kind like land leasing, accounting for over 35% by values of loans in many rural areas (Ihemezie, 2012).

According to African Partnership Forum (2009), despite the proliferation of international public financing for climate change adaptation, in reality they are currently unavailable to rural farmers due to illiteracy, lack of information and other



Abstract

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constraints that limit the knowledge of farmers and consequently their accessibility to credit facilities, thereby constituting a problem of inadequate fund for financing adaptation measures. It has therefore become needful to identify and develop the roles of informal financing for local adaptation to climate change as they appear more accessible, convenient and flexible to rural farmers (Ozor, 2009).

Again, lack of finance from formal or institutional sources has been another major clog on crop farmers and generally, the wheel of agricultural development in Nigeria (Nwibo & Okorie, 2013). Consequently, small-scale farmers rely more on informal sources of agricultural finance. Unfortunately, rural farmers are income and credit poor and face a number of problems in accessing finance (Altman, 2002).

These include: high level of illiteracy which makes them to be unaware of existing credit facilities, communication problems and lack of information about sources of credit, relative social and geographical isolation, land resources that is fragmented and often communally owned and legally inalienable and the problem of security for loan arising from risks and uncertainty of agricultural production. Further problems associated with informal finance limit farmers' access to finance which could be used to carry out adaptation measures on climate change (Bezabih, Abe, Gebreegziabher & Borga, 2013).

Objectives of this paper are: (a) Describe the socio-economic characteristics of the crop farmers using informal financial sources in the study area; (b) determine the effects of crop farmers' socio-economic characteristics on the amount of securable informal finance; (c) describe the different sources and characteristics of informal sources of finance that is available to the crop farmers; and (d) identify the constraints associated with the use of informal finance.

2. Materials and Methods

The area lies between latitude 7°19' East and 7°28' East, as well as longitude 7°00' North and 6°53' North. The study area has an area of 158km² (61sqm) and a population of 147,328 persons (NPC, 2006). For a good data collection and representation of the sample population, 6 communities namely *Ovoko*, *Itchi*, *Ibagwa-Aka*, *Ihenowerre*, *Iheaka* and *Iheakpu-Awakwere* randomly selected. From each of these 6 communities, 10 crop farmers were randomly selected which gave a total of 60 respondents for the study.

2.1 Data Collection

Data were collected from both primary and secondary sources. Primary data were collected using

structured questionnaires and personal interviews. Secondary information was obtained from research journals, bulletins and presentations, theses and related documents on informal financial sources.

2.2 Analytical Techniques

Descriptive statistics such as frequencies and percentages were used to analyze the socio-economic characteristics of the crop farmers using informal financial sources in the study area, the different sources and characteristics of informal finance available to farmers, as well as the constraints roles and uses of informal finance associated with the use of informal finance in climate change adaptation in the study area.

Multiple regression analysis was used to analyze the effect of farmers' socio-economic characteristics on the amount of informal finance that they were able to secure.

Multiple regression analysis function can be represented below:

$$Y = B_0 + B_1Gen_1 + B_2Age_2 + B_3Edl_3 + B_4Ms_4 + B_5Fe_5 + B_6Afi_6 + \mu$$

Where:

Y = Dependent variable (amount of informal finance)

B₀ = Intercept

B₁-B_n = Regression parameters to be estimated

Gen = Gender (1=male & 2=female)

Age = Age (1=≤30, 2=31-40, 3=41-50, 4=51-60, 5≥60 years)

Edl = Education level (1= No formal Education, 2 = primary, 3=secondary, 4=tertiary)

Ms = Marital status (single = 1, married =2, widow=3, divorced =4)

Fe = Farming experience (years) (1=1-20, 2=21-30, 3=31-40, 4=41-50, 5=51-60)

Afi = Annual farm income (1=<51,000, 2= 51,000-100,000, 3= 100001-150,000, 4= >150,000)

μ = Stochastic error term

3. Results and Discussion

3.1 Socio-Economic Characteristics of the Crop Farmers in the Study Area

The socio-economic characteristics of the crop farmers using informal finance were presented in Table 1.

The issue of respondent's gender on access to land and other productive resources like finance is common in the study area. Majority (65%) of the respondents that made use of informal finance were males while 35% were females. This however could be attributed to the fact that males have more access to land and other productive resources than females in the area (Table 1).

The summary of the table however, depicts that more of the crop farmers were older and middle-aged men and women who made use of informal

financial sources for their farming activities and consequently financing adaptation measures.

Table 1 also showed that 30% of the respondents had no formal education, while only 8.3% had up to tertiary level of education. The implication from the result in Table 1 was that majority of the respondents were semi-illiterates and illiterates. About 30% had no formal education, while over 40% had only primary education. Only about 20% and 8.3% had up to secondary and tertiary education respectively.

As depicted in Table 1, it is obvious that more married people used informal financial sources for financing climate change adaptation, and this could be attributed to the fact that more married people were engaged in farming activities in the area. However, this may also not be unconnected with access to finance which usually favours the male farmers.

Table 1 showed that a higher percentage (36.7%) of the crop farmers had above 40 years as farming experience. This is because there are older farmers in the community than the younger ones. Farmer with more than 40 years of farming experience represent about 37% of the studied population, this is the line of the population hierarchy in Nigeria where 30 percent of the total population (160 Million) were in the same age group (CIA World Factbook, 2012).

About 36.7% of the crop farmers obtained an annual farm income ranging from 10,000.00 to 50,000.00. This agrees with the saying that rural farmers were low income earners. However, about 11.7% of the respondents were able to raise an income that was above 150,000.00 per annum.

Analysis showed that the majority (58.3%) of the respondents had farming as their primary occupation followed by trading (25%). Those traders however, engaged primarily in selling of agricultural products.

Minority of the respondents were artisans (10%) and civil servants (6.7%) indicating that many literate civil servants did not reside in the farming areas. This affirmed to the fact that the majority of the respondents had little or no formal education.

Furthermore, the relative majority (30%) of the respondents had trading as secondary occupation followed by those who take farming as their secondary occupation (29%).

This is because many people who are not primarily farmers engaged in small-scale farming as their secondary occupation, while many primary farmers engage in trading or marketing of agricultural produce. However, none of the respondents had civil service and artisanal as secondary occupation.

3.2 Effects of Crop Farmers' Socio-Economic Characteristics on the Amount of Securable Informal Finance

The results of the effect of farmers' socio-economic characteristics on the amount of securable informal finance were presented in Table 2. As depicted in Table (2), age, level of education and the marital status are statistically insignificant.

The obtained results are consistent with the *prior* expectations that due to the flexible nature of informal finance, age, level of education and marital status are not constraints to the amount of informal finance farmers are able to secure. Hence, this makes informal finance a better alternative means for financing climate change adaptation. Farming experience and annual farm income are statistically significant and positively related with the amount of informal finance that farmers are able to secure. The same applies to annual farm income, explains the fact that most lenders tend to lend more money to farmers that they are sure could payback. Hence, the ability to payback would be determined to a large extent by the annual farm income of the farmer.

Also the result showed that gender of the respondent is statistically significant at 1% level of significance and negatively related with the amount of informal finance farmers are able to secure. Thus gender is one of the barriers to acquire informal finance, indicating that men have more access to informal financial sources compared to the women.

3.3 Sources of Financing Climate Change Adaptation

Out of the nine financial sources identified, seven of them are informal sources, while only two are formal financial sources. The extent to which crop farmers obtain funds from each of these sources of finance can be determined by this analysis. Table 3 showed that the sources of finance and their usage by the respondents.

As depicted in Table 3, all the 60 respondents partially financed their farming activity/adaptation to climate change through personal savings in the study area. On the other hand, finance from friends, relatives and/or neighbors are often of interest and collateral free. However, they are not secured sources as they are not received when they are needed. In spite of that, about 38.3% of the respondents obtained their fund from this source to finance adaptation measures (Table 3).

Personal money lenders are people in the community who have loan able funds and were willing to advance them as loan to borrowers on interest. Though this financial source is important, the exorbitant interest rates they charge in order to obtain real positive returns on their capital could account for the reason why only 31.7% of the

respondents chose it as their source of finance. Table 3 also revealed that about 28.3% of the crop farmers obtained funds from Isusu credit associations. Isusu or daily savings club is a credit association found in many rural Nigerian communities for the purpose of contributing fixed sums of money at regular interval to meet the members' various needs.

Result on table 3 showed that about 40% of the crop farmers obtained land through traditional leasing. This source however, provides a veritable means of adaptive measure to climate change through the expansion of cultivated land area, which is an adaptive option against loss of agricultural land. Credits are said to be tied when the informally, socially and/or spatially distant lenders frequently tie their loans to complementary transactions in land, labour or commodities as they lack adequate information about the credit worthiness of the

borrower or suitable physical or social collateral as the case may be.

Table 3 explained that tying of credit³ is uncommon in the study area as only 1.7% of the respondents obtained credit through it. Moreover, the result revealed that no crop farmer in the study area belonged to a cooperative society. This could be attributed to the absence of registered cooperative societies in the study area.

However, even at its absence in the study area, Agbo (2013) maintains that agricultural cooperatives in different parts of the world can enable members to finance and manage climate risks by adapting to climate change. Furthermore, Table 3 showed that no farmer enjoyed any form of credit from the Ministry of Agriculture in the study area. However, 1.7% of the crop farmers could get loans from commercial banks.

Table 1. Distribution of Respondents according to Socio-Economic Characteristics

Feature	Frequency	Percent	Accumulative percent
Gender			
Male	39	65	65
Female	21	35	100
Age			
< 31 yrs	5	8.3	8.3
31-40	11	18.6	26.9
41-50	12	20	46.9
51-60	14	23.3	70
>60yrs	18	30	100
Marital Status			
Single	7	11.7	11.7
Married	46	76.7	88.2
Widow	4	6.7	94.9
Divorced	3	5	100
Education Level			
No Formal Education	18	30	30
Primary	24	41.7	71.7
Secondary	12	20	91.7
Tertiary	5	8.3	100
Annual Farm Income			
<51,000	22	36.7	36.7
51,000-100,000	20	33.3	70
100001-150,000	11	18.3	88.3
>150,000	7	11.7	100
Main Occupation			
Farming	35	58.3	58.3
Trading	15	25	83.3
Artisanal	6	10	93.3
Politics	4	6.7	100
Secondary Occupation			
Farming	27	45	45
Trading	33	55	100
Artisanal	0	0	100
Politics	0	0	100

Table 2. Multiple Regression Analysis Results

Variable	Coefficient	Standard Error	T-Cal	Level of Significant
Constant	-2804.590	6833.898	-0.410	0.683
Gender	-1207.472	234.297	-5.150	0.00
Age	11.948	86.730	0.138	0.891
Education Level	1883.642	1272.118	1.481	0.145
Marital Status	1122.964	1131.610	0.992	0.326
Farming Experience	527.658	82.747	6.377	0.00
Annual Farm Income	0.670	0.170	3.920	0.00
F-cal=28.122 Prob>F=0.000 R ² =0.761 Adjusted R ² = 0.734				

Table 3. Sources of Informal Finance

	Frequency	Percent
Private savings	60	100
Friends, Relatives and Neighbors	23	38
Personal Money Lenders	19	31.7
Isusu Credit Associations	17	28.3
Traditional Leasing	24	40
Tied Credit	1	1.7
Cooperative Societies	0	0

Table 4. Constraints Associated with the Use of Informal Finance

Constrain	Percent
Few number of lender	41.7
Insufficiency of the amount of the informal finance	28.3
Poor accounting knowledge among lenders	28.3
Inconsistency of the informal finance sources	28.3
Unreliability of the informal finance sources	21.7
Charge high interest rate	20.0
No problem with informal finance	15
Ignorant about existing informal credit source	3.3

3.4 Characteristics of Informal Finance

Informal finance can be characterized under the following:

3.4.1 Loan duration: This lasted more than one year as indicated by 68.3% of the respondents.

3.4.2 Collateral: Result from analysis showed that the highest collateral used in informal finance is land (55%), followed by personality (51%). The rest 45% agreed that the loans they obtain from informal financial sources are collateral free.

3.4.3 Interest rate: Majority (73%) of the respondents were reported that they paid no interest rate for credit borrowed from informal sources while only 25% of the respondents reported that the interest they pay is above 10%. However, it was observed that farmers who paid more than 10% interest rates were those who obtained credit from money lenders.

3.5 Constraints associated with the Use of Informal Finance

Irrespective of the importance of informal finance in agricultural production, it is not without some inherent problems that constrains its effective

Table 4 showed the ranking of the constraints associated with use of the informal finance in the context of the study area. Insufficiency of the informal finance sources implies that there are fewer number of the money lenders relative to those who are in demand to informal finance. Insufficiency and inconsistency of the amount of the informal finance, and Poor accounting knowledge among lenders ranked second of the constraints that hinder the use of the informal finance, followed by unreliability of the informal finance sources. Only 15% of the respondents mentioned that they have no problem with use of the informal finance. Despite the available informal finance constraints farmers' encounter, they still depend on the informal finance as one of the main sources of finance to finance their production process.

Another major identified constraint associated with the use of informal finance is the lack of loan supervision from lenders. This was discovered to make some farmers to divert loan meant for financing adaptation measures to uses other than the original purpose.

The result of this constraint showed that all the loans advanced to the respondents were not supervised at all. This gave credence to this unfortunate situation, that lack of loan supervision is a major constraint militating against effective use of informal finance among the farmers.

4. Conclusions and Recommendations

Recent weather occurrences have proved that the climate is more rapidly changing than normal. These changes have an adverse effect on agriculture. Therefore, for agriculture to meet its primary role of ensuring food security in this 21st century, adaptation becomes inevitable. Informal credit alone cannot effectively finance adaptation options, however, it could be used on its limited scale as a supporting alternative owing to the walloping gap between what is currently provided by international funding and what is actually needed.

The Impact of the informal financial sources in adaptation to climate change becomes more prominent in view of the fact that rural farmers who are more vulnerable to the effects of climate change prefer informal to formal finance.

This preference is primarily attributed to flexibility and devoid of bureaucratic procedures of the informal finance. Again, it has also been found that informal finance is more suited to farmers' social, cultural, economic and geographical condition and could easily be used to finance adaptation measures among rural farmers.

In line with the objective of the study, it is recommended that:

Lenders should be encouraged to monitor as well as supervise the use of their loans to ensure that it is used for its original purpose thereby avoiding diversion. This can be achieved through extension awareness.

Owing to the importance of cooperatives in adaptation to climate change, concerted efforts should be made to encourage rural farmers to form cooperative societies among themselves. Government can facilitate this by giving incentives like subsidized credit loans and other farm inputs to cooperative farmers.

There should be an improvement in informal financial rules and regulations (such as model bye-laws), especially as it's relate to cooperatives and Isusu credit associations.

Finally, informal sources of finance alone can't be effectively used to carry out adaptation processes. It should however, be used as a support to formal funding, especially when formal funding is not available or accessible to rural farmers.

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