

THE DYNAMICS OF RURAL CREDIT AND ITS IMPACTS ON AGRICULTURAL PRODUCTIVITY: AN EMPIRICAL STUDY IN RURAL GHANA

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Abstract: Rural households in developing countries continue to have limited access to credit although credit is thought to play a vital role not only in agricultural activities but also in poverty reduction through improving the economic and social wellbeing of the people. Existing studies on rural credit do not allow us to clearly understand the relationship between agricultural production and credit. The main objective of this study is to investigate the relationship between access to credit and agricultural productivity using Ghana as a case study. Data were collected with structured questionnaire from 109 farm households who were categorised into borrowed and non-borrowed households. The results revealed that 66% of the sampled households (109) do not have access to credit. Non-borrowed households on average spend more (GHc675.6) on variable inputs than borrowed households (GHc652.6). However, the yield productivity (cassava, maize and yam) of borrowed households is larger than that of non-borrowed households and the difference is statistically significant at 5% confidence level. Average profit of borrowed households (GHc468.14) is also larger and statistically different from that of non-borrowed households (GHc323.48). The main factor that distinguishes borrowed households from non-borrowed households is livelihood diversification. The reason is that financial institutions prefer given credit to diversified households because of their ability to spread risk across a number of income generating activities. Results of the study imply that for a household to access credit, they must first improve agricultural productivity and this can be achieved by crop diversification. Access to credit will then help the household to diversify the livelihood more and diversification further, will allow such to have access to more credit. We argue that borrowed households with diversified livelihood have the potential to reduce vulnerability and enhance resilience even though using credit for non-farm activities is seen as risk taking strategy. We conclude by proposing an innovative development transitional model with the potential to increase productivity and enhance resilience.

Keywords: Agricultural Productivity, Credit Accessibility, Ghana, Poverty reduction, Livelihood Diversification

INTRODUCTION

Until now, rural communities continue to lack access to key productive assets in their quest to maximize productivity and escape poverty even though the role of rural farm households in global food distribution is undeniably unquestionable. The agricultural sector engages 2.5 out of the 3 billion rural inhabitants in the world (World Bank 2008) and in SSA alone, 80% of the poor depend solely on the sector for their source of livelihood (Calzadilla et al. 2009). Meanwhile, the strong linkages between agriculture and poverty are never doubted. It has been established that 1% GDP growth in agriculture in developing countries increases the expenditures of the poor at least 2.5 times more than the growth emanating from other sectors (Ligon and Sadoulet 2007). Obviously, the importance of agriculture in the lives of people in developing countries can never be underestimated. However, in Sub-Sahara Africa (SSA) the sector is characterised by low productivity due to endemic constraints such as lack of knowledge and inputs, poor access to services and low infrastructural

development among others (Calzadilla et al. 2009). The current observation is that the moderate agricultural growth to some extent is influenced by land expansion which is not consistent with increases in yield or gains in factor productivity (Dewbre and Battisti 2008; World Bank 2008; Breisinger et al. 2008). Improvements, it is said are yet to stimulate enough growth to allow achievement of a sustained structural transformations in SSA (World Bank, 2008).

One constraint which has received considerable research attention (e.g. Feder et. al. 1989, 1990; Petrick 2005; Akudugu 2012; Kuwornu et al. 2013) but still remains inconclusive is the issue of access to credit by smallholders. According to the World Bank global financial inclusion report, 2.5 billion people in the world lack access to financial services (World Bank, 2013) and majority of such are engaged in agriculture and related activities (World Bank 2008). It is reported that only 5% of farmers in Africa and about 15% in Asia and Latin America have access to formal credit, and on an average, across developing countries, 5% of the borrowers receive 80% of applied credit (Swain 2001 cited in Owusu-Antwi and Antwi, 2010). Furthermore, a survey in India shows that 87% of marginal farmers lack access to formal credit and 71% had no access to savings account (World Bank 2007f). Elsewhere in Central and Eastern Europe, 50% of smallholders report credit constraint as a major barrier to growth and expansion of small and medium scale businesses (Sarris, Savastano, and Tritten 2004). Meanwhile, the capacity of rural households and agricultural firms to invest and make timely calculated risk decisions to a larger extent is determined by access to credit facilities (World Bank 2008). Credit is regarded as a key requirement for enhancing economic growth and rising living standards in rural areas and a major means by which rural households liquidity problem can be solved (Petrick 2005). Feder et al. (1990) point out that in production systems, credit is critical in that it determines how much inputs can be used. Carter (1998) summarizes the critical role of credit in performance of agriculture in three ways: (i) it encourages efficient resource allocation by overcoming constraints to purchasing inputs and using them optimally; (ii) it shift input-output frontier if used to acquire modern farm technology and (iii) it increases the use intensity of fixed resources such as land, labour and management.

The emerging conclusion from empirical studies is that there is a positive correlation between credit, productivity and poverty reduction (Feder et al. 1990; Petrick 2005; Jumare 2006; Thilak et al. 2010; Bashir et al., 2010; Rahman et al. 2011; de Castro and Teixeira 2011; Rezaei and Mohammadi, 2011). For instance, the study of Bashir et al. (2010) showed that a percent increase in credit increases wheat yield by 0.245%. The belief is that productivity led growth can be achieved if smallholders get access to requisite inputs necessary for production activities. Improvement in productivity through effective allocation of inputs could be critical in enhancing household welfare.

The issue of agricultural productivity and credit access are particularly pervasive in Ghana. Low agricultural productivity has become a major concern in recent times (Ministry of Food and Agriculture (MoFA) 2007). Emerging speculation even has it that the falling agricultural productivity has propelled rural households to diversify from mainstream crop farming as a means of maintaining minimum income for survival (Awumbila and Ardayfio-Schandorf 2008; Aasoglenang et al. 2013; Hilson et al. 2013). Official report indicates that inadequate access to credit remains a central challenge to smallholders and is a major constraint to agricultural productivity maximization efforts (MoFA 2011). The smallholders comprising 90% and producing 80% of the sectors output (Ministry of Food and agriculture, 2011) are not only resources constrained but also the most vulnerable poverty group (46%) (National Development Planning Commission 2012). In their recent study, Kuwornu et al. (2013) report that 95% of maize farmers lack access to credit.

Little is known about rural credit constraint across the globe. The few existing studies mentioned earlier in addition to the following Ghana specific studies (Owusu-Antwi and Antwi 2010; Akudugu 2012; Kowornu et al. 2013; Dzadze et al. 2012) are not only empirically inadequate, it is also not comprehensive enough to allow us understand the dynamics and complexities of rural credit accessibility. Meanwhile, the connection between credit and agricultural productivity is implicit. Furthermore, little attention has been given to micro level analysis.

This study aims to empirically clarify the dynamics and complexities of rural credit by explicitly exploring the connection between credit and agricultural productivity using Ghana as a case study. It seeks to test the hypotheses that access to credit explains the differences in productivity among rural households. The second hypothesis is that households doing other job aside from crop farming are likely to have access to credit. The study is structured as follows; the next section presents the materials and methods used in the study to be followed by results and discussion. The last section concludes.

MATERIALS AND METHODS

Theoretical and analytical framework

Fig. 1 shows analytical framework of the present study. From the figure, credit (deemed poverty alleviation tool) is obtained from three main sources (formal, semi-formal and informal sources). The purpose is to assist households in their production activities in order to increase productivity thereby escaping poverty (Bateman 2011a) in the process. The assumption here is that credit irrespective of the source can be used in either farm or non-farm sector. However, to a larger extent, the choice depends on the household preference. Some would want to invest in crop farming while others may prefer non-farm activities. Yet still, others may prefer both and the aim of the investment it is to improve livelihood conditions by way of improving productivity (Findeis et al. 2010). The expected outcome of this dynamics is to reduce poverty and enhance sustainable rural development.

The term credit, microcredit and microfinance are often used interchangeably. However, they are not the same. Microfinance “encompasses the provision of financial services and the management of small amounts of money through a range of products and a system of intermediary functions that are targeted at low income clients” (United Nations, 2005). Microcredit on the other hand is the provision of cash and in kind loans in smaller amounts to micro, small entrepreneurs meant to improve business operations (Asiama and Osei 2007, Bateman 2011b). The difference between the two is that microfinance has other components such as savings and micro insurance. However, they all have the aim of allowing the establishment of income generating activities thereby helping poor people to escape poverty (Bateman 2011a, 2011b). In essence, microcredit is one of the products of microfinance but both are forms of credit facilities. For the purposes of this study, there is no distinction regarding the source and type. They are collectively referred to as credit. However, credit is defined here as any resource (cash or kind) provided to individual households either through formal or informal channel for the purposes of production activity.

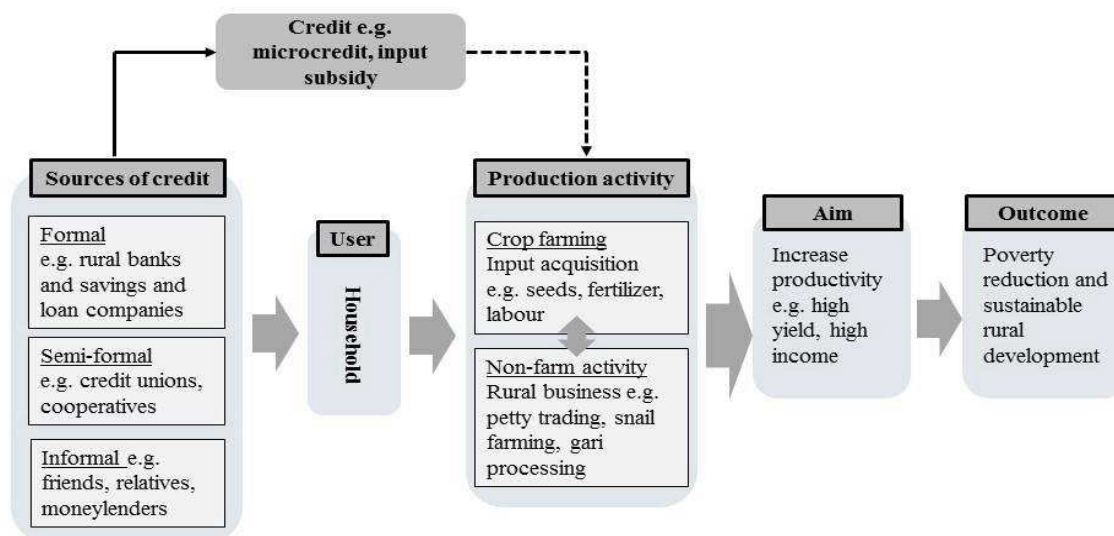


Figure1: Analytical framework

Study area

The research was conducted in Ehiamankyene, one of the communities under Fanteakwa District of Eastern Ghana. The study community (Ehiamankyene) is approximately 20 km away from the district capital, Begoro. The

community has a population of approximately 2000 people with an average of 6 persons per household. The total households in the community were 333. The agricultural sector engages more than 90% of the people. The major crops produced in the area are cassava, maize, plantain, yam, vegetables (tomatoes, cabbage, okra, pepper) among others (Fanteakwa District Assembly 2013).

Data collection

The target group for the study were crop farm households. The study utilized both primary and secondary data. The cross-sectional data were the main data for analysis. Secondary data were sourced from published literature including journals, official reports, working papers and thesis.

The study adopted multi-stage sampling technique. The study community was selected based on interest crops (maize, cassava, and plantain) and production capacity. First, regional comparison of crop production was carried out to select the region with highest production capacity. Based on that, Eastern Region was selected. Similar process was followed in Eastern Region to select the appropriate district (Fanteakwa District) and community (Ehiamankyene) for the study. Regarding the study community, there was a little challenge as production data was not readily available for direct comparison. Here, with the help of the Ministry of Food and Agriculture (MoFA) district office, and based on the above mentioned criteria, three communities (Ehiamankyene, Asarekwao and Otuate) qualified to be selected. However, due to financial and time constraints, only one was chosen which happened to be Ehiamankyene. The final pick was done randomly.

The community was divided into 10 stratum. Twelve farmers were randomly picked from each stratum making 120 in total from the 333 household. Structured interview questionnaire were administered to the 120 households. However, 109 questionnaires were later found to be valid. The other 11 lacked key information (*i.e.* incomplete) and subsequently removed from the sample.

The questionnaire collected data on socioeconomic characteristics of households *e.g.* credit amount obtained, sources of credit, expenditure on farm inputs, harvested output, labour supply, income among others. This instrument was used due to its effectiveness in conducting empirical investigations. Researchers' use this instrument on the premise that it elicits rich, detailed information especially when sensitive information is needed in a study (Ahmed et al. 2011).

Data analysis

Statistical analysis was conducted to determine the significant differences between the means of households yield and income. It was again conducted to determine the differences in factors that accounted for the productivity variations.

RESULTS AND DISCUSSION

Credit accessibility

The data in Table 1 depicts credit access status of households. The result indicates that majority of the sampled households do not have access to credit. Out of the 109 households, 37 (representing 34%) had access to credit whilst 72 (representing 66%) do not have access to credit. Credit is gotten from three main sources (formal, semi-formal and informal). As can be observed from the table, majority (62%) of the borrowed households reported to have received credit from formal sources (specifically rural banks/financial institutions). Only 1 household reported to have accessed credit from semi-formal source as against 13 households from informal sources. The informal sources comprise moneylenders (8%), relatives (16%) and friends (11%). No household access credit from government agency, entrepreneur, employer or landlord. Contrary to expectation, credit is largely sourced from formal sources. Less number (35%) of households opts for informal sources. Semi-formal sources represented by 3% seem not to be an option for borrowed households. The limited credit accessibility is attributed to financial institutions reluctance to advance loans to smallholders as they see crop farming to be vulnerable venture. This stands to reason that most households cannot take advantage of lucrative income generating activities. Feder et al. (1990) argue that access to credit helps improve access to requisite inputs which play critical role in increasing productivity. Lack of credit on the other hand limits effective utilization of inputs (Feder et al. 1989). Fletschner et al. (2010) demonstrate that lack of access to credit reduces farm profits by an average of between 17% and 27%. This result is consistent with the findings of (Dzadze et al. 2012 and Kuwornu et al. 2012) that rural communities in Ghana lack access to credit.

Household investment behaviour

Table 2 shows expenditure behaviour of the households. Specifically, it shows how much households spend on variable inputs. From the table, non-borrowers on average spend more (GHc675.6) on variable inputs than borrowers (GHc652.6). It should be noted here that variations do exist among individual input expenditure. For instance, borrowers spend more on inputs such as fertilizer (GHc104.3), weedicides (GHc62.7), insecticides (GHc44.4) and improved seeds (GHc59.7) than non-borrowers (GHc93.4, GHc51.6 and GHc38.6 respectively). Non-borrowers on the other hand spend more on labour (GHc332.7) and hand tools (GHc123.4). A close look at the table shows that borrowers spend strategically which could be attributed to the investment advice by lending institutions. Financial institutions usually do this is to reduce default risk among producers. The low spending of borrowers' stands to reason that they do not invest all their money in farming activities. It is possible that they use part of the money in doing other things which might benefit them equally. Non-borrowed households on the other hand are likely to invest all their money in farming activities.

Table 1: Credit access status and sources

Access status	Frequency	Percentage (%)
Borrowers	37	34
Non-borrowers	72	66
Total	109	100
Sources of credit		
<i>Formal</i>		
Government agency	-	-
Rural banks/financial institutions	23	62
<i>Semi-formal</i>		
Co-operative	1	3
Entrepreneur	-	-
Employer	-	-
<i>Informal</i>		
landlord	-	-
Moneylender	3	8
Relative	6	16
Friend	4	11
Other	-	-

Source: Field survey, 2013

Table 2: Inputs investment behaviour of respondents

Inputs	Average expenditure of respondents	
	Borrowers (N=37)	Non-borrowers (N=72)
Fertilizer	104.3	93.4
Labour	291.9	332.7
Weedicides	62.7	51.6
Insecticides	44.4	35.6
Hand tools	89.6	123.4
Improved seeds	59.7	38.6
Total	652.6	675.6

Note: All figures in new Ghana cedi (GHc). Hand tools include equipment such as cutlass, hoe, hand fork, watering can etc.

Source: Field survey, 2013

Productivity

Table 3 shows the impact of the investments on yield. It can be seen from the table that significant differences exist among yields of major crops (cassava, maize and yam) between borrowed and non-borrowed households. The differences are statistically significant at 5% confidence level. This result supports the first hypotheses that access to credit explains the differences in productivity among rural households. Clearly, households with credit achieve higher yield productivity compared to those without credit. This result clearly suggests technical efficiency on the part of borrowed households. Borrowed households are likely to use inputs in an optimum manner thereby achieving higher productivity and this is attributed to the technical advice as part of credit package by financial institutions on how to combine the individual inputs in their right proportion to maximize output. The interesting thing here is that even though non-borrowers on average spend more on inputs (GHc 675.6), their expenditure is not consistent with either yield or income productivity as both are lower than that of borrowers. It is likely that non-borrowers inefficiently use inputs which could be due to lack of technical advice and low level of education making it difficult to read and follow scientific instructions. Similar result is recorded for income. The average profit of borrowed household (GHc 468.14) is also statistically different from that of non-borrowed households (GHc 323.48) at 5% confidence level. Table 4 shows the income result. From the two tables (Table 3 and Table 4), it can be said that credit access with its related services is indeed responsible for the high productivity of borrowed households. These results clearly show that borrowed households are productive than non-borrowed households. The findings are similar to previous studies which suggest that positive correlation exists between credit and productivity (Owusu-Antwi and Antwi 2010; Ashaolu et al. 2011; Rahman et al. 2011; Ferdoushi et al. 2011; Ammani 2012). The current result evidently suggest that effort must be made to make credit accessible to rural households as it is critical in improving productivity.

Table 3: Yield productivity of major crops among respondents

Crop	Group								
	Borrowers (N=37)			Std. Dev	Non-borrowers (N=72)			Std. Dev	p-value
Avg. yield (mt/ha)	Min	Max	Avg. yield (mt/ha)		Min	Max			
Cassava	8.540	3	10	5.582	6.305	1	23	4.405	0.040**
Maize	4.333	2	10	1.795	3.569	1	10	1.991	0.050**
Yam	7.030	1	26	5.947	4.682	1	17	3.421	0.045**

Note:** indicates statistical significance at 5% confidence level

Source: Field survey, 2013

Table 4: Agricultural income productivity of households

Group	Average income	Average expenditure	Average profit	p-value
Borrowers (N=37)	1120.7	652.6	468.14	0.040**
Non-borrowers (N=72)	998.8	675.3	323.48	

Note: All figures in new Ghana cedi (GHc). ** indicates statistical significance at 5% confidence level.

Source: Field survey, 2013

Factors accounting for the variation in productivity among households

Table 5 shows the possible factors accounting for the variation in productivity among the households. From the table, it is observed that the variations to some extent are explained by three main factors; age, education and household size of households. The result indicates that borrowers are likely to know how to read and write which makes it somehow easier to fill loan application forms. The differences of these variables between the households are statistically significant at 1% confidence level. Borrowers on average are less advanced in age (46 years on average), have large family size (average of 7 persons per household) and more years of education (average of 10 years) than non-borrowers (53, 6 and 6 respectively). The average age (53 years) of non-borrowers is an indication of old age and perhaps less activeness when it comes to production activities. The fact that borrowers are younger and are able to defy all odds (*e.g.* high interest rate and unpredictable rural environment) to access credit underscores their willingness and ability to take risk to better their lives. It is therefore not surprising that they perform better in productivity than non-borrowers. This result is consistent with the findings of a previous report which stressed that human capital improvement (in the shape of education or training) and age are among the key drivers of productivity improvement (Mallawaarachichi et al. 2009). However, the education result contrasts the findings of Benin et al. (2009) and Randriamamonjy et al. (2009). The later study found the effect of education on agricultural productivity negative. This stems from the fact that as farmers get educated, they tend to shift away from farming activities to areas of higher returns to commensurate their new status. Nevertheless, the results of

Ntow et al. (2006) and Tanaka et al. (2013) lend support to the current finding as it show the critical role of education and knowledge in enhancing agricultural productivity. Ntow et al. (2006) observed that farmers in Ghana as a result of lack of knowledge indiscriminately combine two or more chemicals with the aim of speeding up effect. Meanwhile, this act can increase incidence of pest infestation which can affect output in the long run. This underscores the critical role that education can play in productivity improvement. But it should be noted that credit comes as a package and has investment training as one of the packages. So education cannot be isolated from the package. This is because knowledge in itself is useless without the money for the investment.

Again, the less family size of non-borrowers is an indication of less pressure on their households which to some extent influence their decision not to borrow. However, the opposite is true for borrowers. It is likely that borrowers have to work extra hard to ensure the sustainability of their large household. The large family size suggests available household labour which is important when it comes to production process. However, the difference in farm size is not significant. Scatter plots of farm size against yield of the major crops (cassava, yam and maize) show no direct relationship or evidence of farm size influencing yield productivity (results not shown). What this means is that access to credit with its related services is indeed the major reason that explains the observed productivity differences. This result contrast the popular opinion that the moderate growth in the agricultural sector is to some extent influenced by land expansion (Diao et al. 2008; Dewbre and Battisti 2008; Breisinger et al. 2011).

Table 5: Factors accounting for the variation in productivity among households

Variable	Borrowers (N=37)	Non-borrowers (N=72)	p-value
Age	46	53	0.002***
Schooling years	10	8	0.001***
Household size	7	6	0.004***
Farm size	5	5	0.722 ^{NS}

Note: *** indicates statistical significance at 1% confidence level. NS indicates non-significant.

All figures are averages of the respective variable.

Source: Field survey, 2013

Households' motivation for borrowing and not borrowing

Table 6 presents households reported motivation for borrowing and not borrowing. From the table, on one hand the two major reasons reported by borrowed households as their motivation to borrow are; for doing non-farm business activities (95%) and purchasing of farm inputs (81%). On the other hand, two major reasons why most households desist from borrowing are as a result of high interest rate and complex application procedures represented by 81% and 58% respectively. Other borrowing motivations include; land purchasing (5%) and for personal consumption (2%). Furthermore, other reasons for not borrowing include; inadequate collateral (47%), avoidance of debt (46%), no need for it (26%) and belief of refusal (19%). The result clearly suggests that most households borrow for production activities. However, a surprising revelation is the use of credit for non-farm business activities. This is a clear indication of livelihood diversification which is critical for enhancing household resilience ensuring sustainability. Earning from multiple sources contribute to household robustness especially in an event of crop failure which is rampant in the study community during dry seasons. Diversifying livelihood in this context is seen to be a risk spreading strategy aimed at reducing vulnerability and enhancing household resilience to both internal and external shocks.

It is also clear that households do not borrow for just reasons. High interest rate, complex application process, inadequate collateral and avoidance of debt suggest to some extent that the standard of living of most non-borrowed households in the study area is low. This is because complex application process implies low level of education and here, most of them cannot read and write hence difficult to fill the application forms. High interest rate, inadequate collateral and avoidance of debt suggest lack of assets endowment which can be used as collateral and converted to cash in period of default. The reported complex application process is a major disincentive. This is

particularly true with formal lending institutions. Taking into consideration the low level of education of the people, anything that has to do with paper and pen scares them and it is therefore not surprising that most avoid borrowing.

Table 6: Reasons for borrowing and not borrowing

Reason for borrowing	Frequency	Percentage (%)
For non-farm business activities	35	95
Buy farm inputs	30	81
Buy agricultural land	5	16
Personal consumption e.g. pays school fees etc....	2	5
For consumer durables e.g. buy TV etc...	1	3
As working capital	1	3
Other agricultural cost	2	5
On lending	-	-
Other business expenses	-	-
For ceremonies e.g. funerals, marriage etc...	-	-
Reasons for not borrowing		
High interest rate	58	81
Complex application process	42	58
Inadequate collateral	34	47
Avoidance of debt	33	46
No need for it	19	26
Believe would be refused	14	19
No lender knowledge	10	14
Long commuting distance	6	8
Other	1	1

Note: multiple responses recorded

Source: Field survey, 2013

Livelihood diversification

Table 7 shows alternative jobs among the households. From the table, 95% of borrowers are engaged in other activities aside from crop farming. Reported alternative jobs include petty trading (18), manufacturing (8) and other jobs including but not limited to vegetable cultivation, snail farming and masonry (9). Out of the 37 borrowed households, 35 representing 95% are engaged in livelihood diversification. Diversification enhances the productive capacity of borrowed households to attract financial support. But same cannot be said of non-borrowed households. Only 7 households out of the 72 non-borrowers representing 10% are engaged in livelihood diversification. Three of such are doing petty trading while the other four do other activities explained earlier. This result supports the second hypothesis that households doing other jobs aside from crop farming are likely to have access to credit. Livelihood diversification explains the secret of borrowed households. Income from these activities compliments that of farming and gives them the opportunity to afford certain farm inputs such as fertilizer, labour and weedicides which contribute to productivity improvement (Hilson *et al.* 2013). These households are likely to be hit hard by shocks

which frequently emanate from the farming sector as a result of climate variability and unfavourable microeconomic policies. Surprisingly, all the diversified avenues are self-employment. The self-employment dominance is consistent with the findings of Senadza (2012) that non-farm self-employment dominates rural Ghana. The truth is that unless one is diversified, financial institutions will not give credit since they see crop farming alone to be risky venture. The result suggests that rural households are spreading risks across a number of income generating activities. In fact, in recent times the idea that growth in farm output will create lots of non-farm income earning opportunities in rural areas via linkage effects is said to be no longer tenable. This is due to the fact that for many rural families, farming alone is not enough to provide sufficient means of survival (Ellis 1999). It therefore makes livelihood diversification prominent to compliment farming income (Hilson *et al.* 2013).

The Asia-Pacific Human Development Report (2012) has highlighted that diversification of on-and off-farm income generating activities is critical for enhancing resilience and reducing poverty in rural areas. Simtowe (2010) also stressed that diversified households enjoy higher flexibility and resilience capacity than undiversified households. For the purposes of this study, it has been established that diversification also enhances households' chances of accessing credit. The result is similar to previous studies which report that diversification is critical for managing risk, increasing household income and enhancing rural household welfare (Bezemer *et al.* 2005; Ibrahim *et al.* 2009; Olusola and Adenegan 2011; Simtowe 2010; Kasem and Thapa 2011).

Table 7: Alternative jobs among households

Group	Types of diversified activities				total	(%)
	Petty trading	Manufacturing	service	Other		
Borrower (N=37)	18	8	-	9	35	95
Non-borrowers (N=72)	3	-	-	4	7	10

Note: Other activities include snail farming, vegetables growing etc. Manufacturing includes processing activities such as gari processing, oil palm production, carpentry work, brewing etc.

Source: Field survey, 2013

An innovative development transitional model of household behaviour

This section proposes an innovative development transitional model of household behaviour. It should be noted that the model is supported by the study results.

The model (Fig. 1) is underpinned by productivity improvement, diversification and credit access and it is ideal for improving agricultural productivity and enhancing household resilience. The households are categorized into three ((stages 1 - early stage), (Stage 2 - middle stage) and (Stage 3 - sustainable stage). Each stage represents a group of households with specific characteristics and preconditions for transition. Stage 1 represents non-borrowed households, Stage (2) represents borrowed households and Stage (3) represents sustainable households. Though Stage (2) and (3) are all borrowers, Stage (3) is more secured than (2) because of the magnitude of activities. Following are the explanations of the stages.

Early stage: This stage is marked by non-borrowed households. Households here are characterised by subsistence production, limited push diversification, no credit, limited access to internal and external markets and low productivity. Such households are constrained as far as production activities are concerned. Lending institutions such as rural banks perceive them to be highly vulnerable. This is because of their high susceptibility to shocks as they depend solely on crops. For such households to migrate to stage 2, they should improve their productivity first by means of crop diversification (e.g. vegetables which has short gestation period and fetch good money within a short period of time), intensification of farming activities and intensive push diversification (i.e. diversifying into areas of less productivity as a short term coping strategy). Doing such activity will enhance the productive capacity of the households. However, there should be external interaction to ensure successful transition. Policy should

support capacity building of farm households and provide information regarding existing business opportunities. These will enhance improving productivity and access to credit particularly from financial institutions.

Middle stage: Stage (2) is represented by borrowed households. Households here have already passed the early stage. The stage is characterised by access to credit, intensification, limited access to external market and partial pull diversification. Here, activities are viable enough to attract financial support from lending institutions. Households are not solely dependent on producing staples but do engage in other activities such as snail farming, petty trading and vegetables (see Table 12). In other words, households are involved in partial pull diversification. There are two types of diversification; distress-push diversification (coping) and demand-pull diversification (accumulation) (Reardon et al. 1998; Haggblade et al. 2002). According to Barret et al. (2012), distress-push diversification is associated with constraints-related reasons while demand-pull is as a result of desire to take advantage of new opportunities in other sectors. Bezemer et al. (2005) argue that distress-push diversification is peculiar to less-endowed and low income households while demand-pull diversification is usually a response to evolving new market or opportunities which may be associated with the potential of increasing labour productivity and household income thereby accumulating financial and asset wealth. The current study observed these diversification types. Middle stage households can migrate to the next phase (sustainable stage) by engaging in full demand-pull diversification, crop specialization (cash crops such as cocoa and oil palm), and taking advantage of external market opportunities. Policy should support formation of social networks such as Farmer Based Organisations (FBO’s) and cooperatives. The social groups would be key for mutual assistance especially in times of both internal and external shocks such as death or drought.

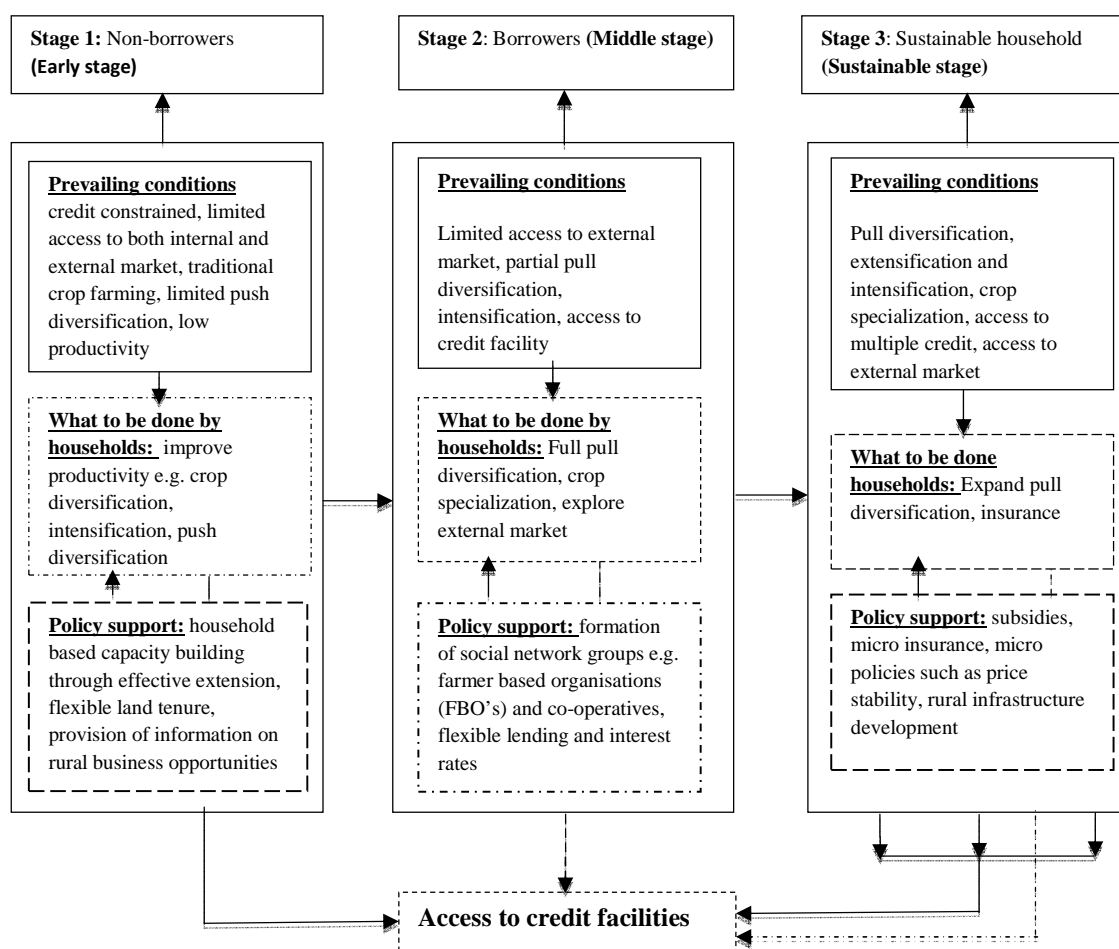


Figure 1: Innovative development transitional model of household behaviour

Sustainable stage: The last stage is Stage (3) (sustainable stage). Households here have passed through the previous stages. The stage is characterised by pull diversification, extensification and intensification, crop specialization (e.g. cash crops such as cocoa and oil palm), multiple access to credit and access to both internal and external market. This category of households is less vulnerable compared to the others. The stage is said to be sustainable owing to the magnitude of livelihood strategies available. They are able to extensify because of large land endowment. Range of pull-diversified activities include but not limited to gari processing, cash crops, livestock and local gin brewing. These products are in high demand in the community. It should be noted that one requires a substantial amount of money to be able to start these businesses. An average of GHc1000 (equivalent to USD 321.91 for a rate of USD 1 = GHc 3.11) for instance is needed for gari processing business. The large initial capital requirement hinders middle stagers from taking full advantage of demand driven activities. Evidence shows that lack of financial resources limits the ability of households to enter into lucrative off-farm businesses (Babulo et al. 2008). By expanding pull-diversification and taking insurance packages, the stage can be argued to be in resilient zone. Favourable micro economic policies and rural infrastructural development has to be taken into consideration by the government. Households here have the capacity to bounce back while maintaining their functionality in an event of adversity such as flood or drought. Scoones (1998) argues that mix of activities is critical for enhancing the resilience of a system in the sense that impacts of stresses and shocks are less felt

These innovative processes are the range of options available to the households in the study area. The model can be applied in any environment where rural households exhibit similar characteristics. It is believed that application of the model would improve rural household productivity and foster resilience. But it should be noted that not all households at Stage (1) can progress to Stage (3). This is because of the conservative nature of some households. It is only those who are willing to take risk and exhibit the innovative characteristics that are likely to pass through the transitional processes. The model is therefore not restrictive to all households. Meanwhile, the success of this model will largely depend on how well policy supports the transitional process in individual stages. It is hoped that rural development and poverty reduction policies will target these areas.

CONCLUSIONS

This study aimed to empirically analyse the connection between credit and agricultural productivity. We found that the study community has limited access to credit. Investment behaviour analysis show that non-borrowed households on average spend more on variable inputs than borrowed households. However, the higher expenditure of non-borrowers does not correspond with either yield or income productivity. Borrowed households though spend less, achieve higher productivity than non-borrowed households. We argue that borrowed households are technically efficient than non-borrowed households and their efficiency is attributed to the technical advice by lending institutions as part of the credit package. In addition, borrowed households are on average less advanced in age, engaged in multiple livelihood portfolios, have larger family size and have more years of education than non-borrowed households. However, the main differentiating factor between the two households is livelihood diversification. This is because financial institutions prefer dealing with households which can spread risk across a number of income generating activities. Furthermore, we found that borrowed households ostensibly borrow for non-farm business activities and for purchasing of farm inputs. Non-borrowed households on the other hand do not borrow due to high interest rates and complex application process. We further argue that the use of credit for non-farm activities is a risk spreading strategy among borrowed households as diversification has the potential to reduce vulnerability and enhance household resilience. Our results evidently suggest that livelihood diversification is not only crucial for accessing credit but also critical for enhancing household productivity and it is key step to rural household development transition. Any attempt to enhance rural accessibility to credit to facilitate production activities must therefore consider livelihood diversification. Lastly, the study proposes an innovative development transitional model with the potential of increasing productivity and enhancing household resilience.

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