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Impact Analysis of Microfinance on Crop Production in Ghana

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Abstract *Agriculture is the major means of livelihood for the rural people of Ghana. It is also the backbone of national economies, the main source of foreign exchange and the most important source of employment. It is not surprising that in the 1980's the paradigm shifted towards agricultural finance in developing countries. Microfinance became the alternative to the fall-out of government intervention to alleviate poverty through credit support to rural farmers. However, till now, no study has been conducted to ascertain the impact of microfinance on crop production in Ghana. This paper therefore investigates the impact of microfinance on crop production in Ghana with specific reference to the East Mamprusi District (EMD) of Ghana. The paper employed the quantitative method approach. The sample size that was used in the study was hundred (100) respondents who were drawn from the list of farmers in the district who have accessed microfinance. The results show that there is a significant relationship between microfinance and crop production. Also, consistent with the perceptive views of the respondents on the impact of microcredit on crop production, the regression result showed that a GH¢1 increase in microcredit to the farmers would increase crop production by more than one-third (0.314) of a bag. This shows that microcredit has significant impact on crop production.*

Key words Microfinance, Microcredit, Crop Production, Impact Analysis, East Mamprusi Distric (EMD), Ghana

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1. Introduction

Microfinance is increasingly being used to assist farmers in rural and peri-urban centres in recent times. Although governments and international aid donors have been subsidizing credit to small farmers in rural areas of many developing countries (Miller, 2011), microfinance is seen as viable alternative in reaching out to the poor farmers in rural communities who largely depend on subsistence agriculture. According to Ledgerwood (1999), microfinance is the provision of a broad range of financial services such as deposits, loans, savings, payment services, money transfers, and insurance to the poor and low-income households and their micro-enterprises who are excluded from the formal financial systems. Similarly, Schreiner and Colombet (2001) see microfinance as the attempt to get better access to small deposits and small loans for poor households neglected by banks. Thus, following the strand of the definitions, microfinance involves the provision of financial services such as savings, loans and insurance to poor people living in both urban and rural settings who are unable to obtain such services from the formal financial sector.

By far, agriculture is the major means of livelihood for the rural people. It is also the backbone of national economies, the main source of foreign exchange and the most important source of employment (Tenaw & Islam, 2009). Therefore, the argument in the literature has been very consistent in terms of using microfinance to increase crop production. In this backdrop, Meyer (2007) argues for the adoption of microfinance in crop production since it has the potential of increasing crop production and impacting the lives of farmers. It is not surprising that in the 1980's the paradigm shifted towards agricultural finance in

developing countries (Meyer, 2007). Microfinance became the alternative to the fall-out of government intervention to alleviate poverty through credit support to rural farmers. In the Ghanaian context, although the Agricultural Development Bank (ADB) provides credit facilities to farmers to increase crop production, microfinance institutions are now at the forefront of advancing credit to farmers.

Despite the recent growth in the microfinance sector, advancing loans and credit to farmers to increase crop production is still a challenge (Tenaw and Islam, 2009). Miller (2011) reports that in order for microfinance organizations to venture into crop agriculture, it is important to understand the context of crop agriculture and their potential role in it. Indeed, agricultural microfinance is not business as usual but requires a different approach from that typically applied in many microfinance organizations. The agricultural sector is characterized by generally much lower returns on capital, slower velocity of capital, higher uncontrolled risks and less understanding of finance and business (Miller, 2011). Also, although it is argued that improved productivity and output levels will be achieved through the introduction of new production technology, credit is a prerequisite to gain access to such technology particularly for the small-scale farmers in Africa with little or no capital of their own. Therefore, microfinance is very critical in increasing crop production.

Despite the critical role of microfinance in crop production in developing countries (Morvant-Roux, 2008) (including Ghana), its impact is yet to be felt in East Mamprusi District. Moreover, although there is a growing literature on the impact of microfinance on crop production (For example, Effa & Hering, 2007; Morvant-Roux, 2008; Adams & Bartholomew, 2010; Girabi & Mwakaje, 2013), no study of this kind has been done in the East Mamprusi District (EMD) of Ghana. Again, even though similar studies have been conducted elsewhere in Africa, no study has sought to investigate the magnitude of the impact microfinance has on crop production. This paper therefore aims to fill this research gap by assessing the impact of microfinance on crop production and the magnitude of the impact or relationship in the East Mamprusi District of Ghana.

Research Hypothesis

The hypotheses to be tested is stated in words and formulated statistically as follows:

Null Hypothesis: There is no relationship between microfinance and crop production in the East Mamprusi District of Ghana.

Alternative Hypothesis: There is a significant positive relationship between microfinance and crop production in the East Mamprusi District of Ghana.

H_0: $\rho=0$; there is no relationship between microfinance and crop production in the East Mamprusi District of Ghana.

H_1: $\rho>0$; there is a significant relationship between microfinance and crop production in the East Mamprusi District of Ghana.

The rest of the paper is organized as follows: section 2 reviews some literature on microfinance, followed by a discussion of the study variables and the methodology in section 3. Section 4 captures the analysis and discussion of findings, followed by the conclusion in section 5.

2. Literature Review

Concept of Microfinance

According to the United Nations (2000, 2005), microfinance refers to small financial transactions with poor households and micro-businesses, using untraditional approaches, non-standard approaches. It is further reported that such procedures include character-based lending, group guarantees and short-term repeat loans. It means making the poor benefit from access to financial services (savings and credit facilities). Indeed, in a broader sense, microfinance includes the offer of small financial services and the management of small amounts of financial resources through an array of financial products and a system of intermediary functions that are targeted at low income earners (United Nations, 2000, 2005).

Khavul (2010) argues that microfinance is a new word, which is popularly used in the field of finance in recent times. He further argues that the term microfinance constitutes two words: micro and finance, which could mean small credit or 'microcredit'. Nonetheless, the concept of microfinance goes far beyond small credit and it is to be noted that not all small credit is microfinance (Khavul, 2010). Likewise, Ghosh (2006) explains that microfinance constitutes various financial services, which mostly includes savings and credit. It also contains other services like insurance, directed to eventually benefit the poor or disadvantaged section of the population, especially those who are economically poor.

Robinson (2001) sees microfinance as small-scale financial services primarily credit and savings provided to people who farm or fish or herd; who operate small enterprises or micro enterprises where goods are produced, recycled, repaired, or sold; who provide services; who work for wages or commissions; who gain income from renting out small amounts of land, vehicles, draft animals, or machinery and tools; and to other individuals and groups at the local levels of developing countries, both rural and urban. In fact, although it is true that many MFIs do not take collateral, especially if they are focusing on the poorest that normally do not possess any collateral, several MFIs do require some form of collateral. In the case of farmers, for instance, the farmers are only given credits only for them to repay after harvesting. The Grameen Bank Model of micro financing in the context of Bangladesh is an example of micro assistance to farmers (Besley & Coate, 1995).

Evolution of Microfinance

The microfinance has evolved and developed in line with different growth patterns and paths in various countries and regions. According to Brown (2011), savings and credit groups that have operated for centuries include the "susus" of Ghana, "chit funds" in India, "tandas" in Mexico, "arisan" in Indonesia, "cheetu" in Sri Lanka, "tontines" in West Africa, and "pasanaku" in Bolivia, as well as numerous savings clubs and burial societies found all over the world. He also argue that the formal credit and savings institutions for the poor have also been around for decades, providing customers who were traditionally neglected by commercial banks access to financial services through cooperatives and development finance institutions.

Although experiments of microfinance in some countries like Brazil and Bangladesh dates back several years, Ledgerwood (2000) reports that microfinance started to gain popularity in the 1980s. Certainly, the history of microfinance can be dated back to Europe in 18th and 19th century. For instance, in the 18th century there were informal savings clubs like box clubs that dealt with community lending and savings (Brown 2011). Also, the famous example could be of the Irish Loans Funds, which basically came into existence as a result of increased poverty in the 1720's. It is reported that these credit groups started as charitable organizations and later transformed into financial intermediaries. And this allowed them not only to charge interest on the loans they advanced to their clients but also collect interest bearing deposits.

Brown (2011) reports that in 1840 about 300 of such institutions emerged whose outreach covered 20% of households in Ireland. However, due to intervention from the commercial banks, their advantage was lost and therefore they collapsed in the 1950s. Similarly, Siebel (2003) suggests that there were other instances of microcredit in Europe mainly in Germany. Between the 1950s and 1970s, governments and donors focused on providing agricultural credit to small and marginal farmers, in hopes of raising productivity and incomes. These efforts to expand access to agricultural credit (Brown, 2011) emphasized supply-led government interventions in the form of targeted credit through state-owned development finance institutions, or farmers' cooperatives in some cases, that received concessional loans and on-lent to customers at below-market interest rates.

In the Ghanaian context, Bank of Ghana (BoG) (2007) indicates that microfinance is not a new concept, but a practice that has been common with the people prior to independence. According to the BoG report although unreliable evidence suggests that the first credit union in Africa was established in Northern Ghana in 1955 by the Canadian Catholic Missionaries, its presence was not widely felt through the country in particular and Africa in general. Also, it is argued that the present day microfinance schemes in Ghana might have originated in Nigeria and spread to Ghana from the early 1900s. Although the microfinance practice had grown from leaps and bounds from the 1900s, the introduction of various financial sector policies and programs such as the provision of subsidized credits, establishment of rural and community banks (RCBs), the liberalization of the financial sector and the promulgation of PNDC Law 328 of 1991, that allowed the establishment of different types of non-bank financial institutions, including savings and loans companies, finance houses, and credit unions and so on has further strengthen microfinance activities in the country.

Currently, there are three main kinds of microfinance institutions operating in Ghana. These comprise the formal suppliers of microfinance (that is rural and community banks, savings and loans companies, commercial banks), the semi-formal suppliers of microfinance (that is credit unions, financial non-governmental organizations (FNGOs), and cooperatives), and the informal suppliers of microfinance (for

example, susu collectors and clubs, rotating and accumulating savings and credit associations (ROSCAs and ASCAs), traders, moneylenders and other individuals) (Brown, 2011).

Models of Microfinance

Grameen Bank model

This model was initiated by Dr. Mohammed Yunus in Bangladesh and is now replicated around the world. Groups are formed on a voluntary basis and the groups consist of five members. The basic setup involves joint-liability, where all members in the group are treated as being in default if any other member in the same group fails to meet her payment obligation (Besley & Coate, 1995), and dynamic incentives which means that the borrower (or the group) is cut off from future borrowing if he or she fails to meet their payment installments and where bigger loans are granted over time if the previous one has been paid back in an orderly manner. These conditions make it paramount to choose suitable group members. Repayments are made in public, which further enhance the motive to pay installments accordingly in order not to lose face. According to Nasir (2013), the features of the Grameen Bank model are low transaction cost, no collateral (peer pressure is sufficient), repayment of loan in small and short interval and quick loan sanctions with little or no paper works and no formalities.

Village Bank Model

A Village bank has two main sources of funds, the external account and the internal account. The external account represents capital provided by an external source that is lent to the members of the "bank". The internal account is made up entirely by the savings of the group members, which can also be lent to other group members. The average number of members per a group is from thirty (30) to fifty (50) and the loans are repaid on a weekly basis. The objective is that the "bank" will be self-sufficient, i.e. not dependent on the external account for funding (usually within a timeframe of three years) (Brown, 2011). Therefore, the main difference between the Grameen Model and the Village Bank Model is the accumulation of capital in order to become autonomous from the initial source [any external] for funding. This practice is very common in the northern part of Ghana.

Credit Unions

According to Brown (2011), a credit union is a financial cooperative (non-profit) owned and controlled by its members with the objective of issuing loans and collecting savings. A credit union can provide some training to support the members. There are regional differences in the case of Africa. East Africa demonstrates moderately poor results in the credit union activities whilst West Africa is more promising (Sharief & Sherief, 2007). Due to the structure of a credit union (only providing financial services to members) the outreach is fairly limited which is further constrained by the low capital growth.

Self-Help Groups (SHG)

Self-help groups are popular in India owing to the fact that they can easily be set up within the legal framework in the country (Nasir, 2013). An SHG is a small group of about 20 persons from the same homogenous group who come voluntarily to attain certain collective goals, social or economic. The group mobilizes savings among its members only and provides need based loans to members only. The internal transactions are strengthened first and after that NGO supporting the group links them up to banks for financial assistance (Nasir, 2013).

Cooperative Model

A cooperative is an organization owned by the members who use its services. This model works on a principle that every community has enough human and financial resources to manage their own financial institutions. The members, who own it, are the members who use its services and come from different sections of the same community such as agriculture, retail, and wholesale and so on (Nasir, 2013).

Other Models within the Ghanaian Financial Industry

Brown (2011) opines that several models of MFIs exist within the Ghanaian Financial Industry. For example, savings and loans Companies, rural banks, private owned financial services companies, credit unions and "susu" groups are the most common variety of MFIs that exist in Ghana. While the savings and loans and rural banks are directly regulated by Bank of Ghana, the others are not. The various MFIs in the Ghanaian industry demonstrate all the characteristics explained above.

Microfinance and Agricultural Production

According to Morvant-Roux (2008), the old rural finance paradigm of the 1960s and 1970s was based on public authorities' desire to facilitate access to rural finance. The objective was to promote agricultural development by modernizing agriculture. The most common approach involved direct government intervention via state-owned development banks and direct donor intervention in credit markets with favourable terms and conditions like soft interest rates or lenient guarantees (Morvant-Roux, 2008). Nevertheless, Meyer (2007) reports, that this system was costly and unsustainable, due to poor repayment, and ultimately did not have the desired effect on the development of agriculture production.

In the 1980's, the failure of government-led credit supply gave way to a new paradigm and a renewed approach to rural and agricultural finance in developing countries. State-owned development banks closed, financial sectors were liberalized and microfinance evolved. According to Zeller (2003), despite the great hopes associated with the strong growth of the microfinance sector, it soon became clear that the supply of microfinance for agricultural activities was marginal at best and poorly adapted. At the same time, with the liberalization of the financial sector, commercial banks did not pick up the slack of former government-led interventions in rural areas; many banks actually closed their rural branches (Zeller, 2003).

Effa and Herrings (2005) conducts an Ex Post Facto non-equivalent comparison design to examine the impact of MFI on the livelihood of rural women (especially rural women farmers). The findings show that rural women who participated (clients) in the MFI program gained an increase in income and savings compared to those who did not participate (non-clients). They also find that clients adopted agricultural innovations at a significantly higher rate than non-clients. Quite recently, Girabi and Mwakaje (2013) study the impact of microfinance on smallholder farm productivity in Tanzania. Using descriptive and regression analysis, they find that credit beneficiary realize high agricultural productivity compared to the non-credit beneficiary respondents. They also find that major factors hindering smallholder farmers' access to credit are lack of information, inadequate credit supply, high interest rates and defaulting.

Microfinance's Contribution to Agricultural Finance

Morvant-Roux (2008) argues that despite the important contribution of agriculture to the GDP of the poorest developing countries, the supply of financial services to farmers is still limited. He further opines that the more rural populations contribute to GDP and the greater the percentage of agricultural workers, the lower the rate of financial inclusion. It is a universal affirmation that microfinance can play an important role in agricultural finance and is capable of mitigating the many challenges associated with the sector (Morvant-Roux, 2008). In order to increase farmers' access to microfinance, several conditions must be met (Morvant-Roux, 2008):

1. Organisation of the agricultural sector;
2. Professionalization of the various actors, at all levels;
3. A supply of diversified and well-adapted financial services;
4. Access to non-financial services that promote agricultural development;
5. MFI access to medium- and long-term refinancing, at affordable rates;
6. Diversification of regions and types of activities financed, keeping in mind the primary objective of financing rural and agricultural sectors;
7. A regulatory framework adapted to the challenges of agricultural and rural finance.

These various factors underlie the fact that meeting the financial needs of farmers on a sustainable basis requires governments (including the Ghana Government) to support the microfinance sector, as was the case, for example, in the creation of agricultural credit institutions in France.

3. Methodology of the Study

The population of the study was made up of all farmers who had accessed microfinance and applied same in their crop production in East Mamprusi District of Ghana. The sample size was hundred (100) farmers in the district who have accessed microfinance. The respondents were selected using purposive sampling technique of the non-probability method. The sample selection was done in line with the suggestion by Cooper and Schindler (2003). According to them, a sample size of a hundred (100) respondents is good for any statistical analysis. The study employed the quantitative method. This is because the quantitative method is an appropriate methodological tool in investigating empirical and theoretical relationship between variables.

According to Cohen *et al.* (2000), the quantitative approach helps to explain causal relationships between variables, uses quantitative data, tests hypothesis and uses highly structured methodology to facilitate replication. The survey design was used because data was collected from diverse farmers who had accessed microfinance at the same time (Cooper & Schindler, 2002).

The data for the study was collected mainly through survey questionnaire. According to Cooper and Schindler (2002), questionnaire, among other data collection instruments, is an easy and practical means of gathering data from a large population. The questionnaire was divided into two sections, A and B. While section A had items on the demographic characteristics of the respondents (for example, gender, age and marital status), section B contained items on the impact of microfinance on crop production (for example, what is the impact of microfinance on crop production?). The questions were mainly in the mixed approach except in few cases that the researcher used 5-point Likert type questions with responses such as strongly disagree (1) to strongly agree (5). Although the survey questionnaire was mainly the instrument used for the primary data collection, interview guide played a complementary role. The researchers used the interview guide to elicit vital pieces of information which the twenty (20) questions in the questionnaire could not elicit. The questionnaire was then distributed to the 100 respondents with the help of ten (10) research confederates (or assistants). The respondents were given one week (7 days) to answer and return the questionnaire. This approach was adopted in order to ensure a higher response rate. The variables on which data was collected are operationally defined below.

Microfinance: microfinance in the context of this study is the provision of a broad range of financial services such as insurance, credits and loans to farmers who cannot access funds from banks. It is a quantitative variable but was transformed into a qualitative variable and regrouped as very broad, broad and narrow.

1. Very broad means covers over 70% of the farmers' financial needs.
2. Broad means covers between 50 to 70% of the farmers' financial needs.
3. Narrow means covers less that 50% of the farmers' financial needs.

Crop production: crop production refers to growing of crops either for sale or domestic consumptions. It is a qualitative variable regrouped as high, moderate and low.

1. High means growing crops on over 10 acreage of farmland.
2. Moderate means growing crops on 5 to 10 acreage of farmland.
3. Low means growing crops on less than 5 acreage of farmland.

The primary data obtained from the respondents was analysed using descriptive and exploratory data analysis techniques. The first research objective, which is, impact determination was analysed using the chi-square test of independence at 5% alpha level, while the second research objective, which is, determination of the magnitude of the impact was analysed using the Ordinary Least Square (OLS) regression model. Eviews5 was used for all the statistical analysis.

Model Specification

The model to analyse the second objective is specified below:

$$CP = \beta_0 + \beta_1 MC + \varepsilon_i \quad (1)$$

Where CP (dependent variable) and MC (independent variable) are the crop production and microcredit corresponding to i-th farmer in the sample, respectively. β_k is the k-th regression parameter of interest and ε_i is the error term.

4. Analysis and Discussion of Findings

Table 4.1. Gender of Respondents

	Frequency	Percent	Cumulative Percent
Male	74	74.0	74.0
Female	26	26.0	100.0
Total	100	100.0	

Source: Survey Data, 2014

Table 4.1 shows that 74 respondents representing 74% reported they were males while 26 respondents representing 26% reported they were females. The analysis has revealed that the male respondents are 48% more than their female counterparts. The analysis is reflected in the pie chart below.

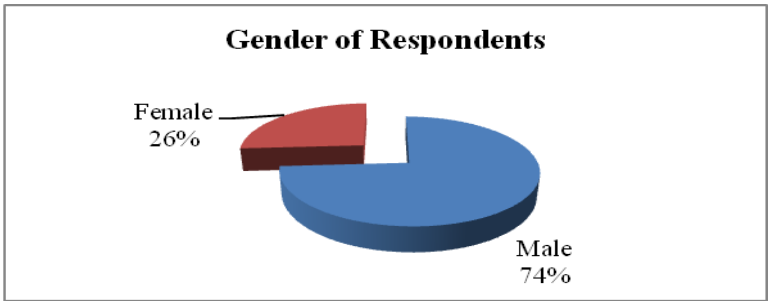

Figure 4.1. Gender of Respondents

Table 4.2. Age of Respondents

	Frequency	Percent	Cumulative Percent
18-30	29	29.0	29.0
31-40	30	30.0	59.0
41-50	32	32.0	91.0
Above 50	9	9.0	100.0
Total	100	100.0	

Source: Survey Data, 2014

Table 4.2 depicts that 29 (29%) of the respondents claimed they were between the ages 18-30 years while 30 (30%) of the respondents claimed they were between the ages 31-40 years. Also, 32 (32%) of the respondents claimed they were between the ages 41-50 years while 9 (9%) claimed they were above 50 years. This shows that most of the respondents were in 41-50 age brackets. The analysis is shown in the bar graph below.

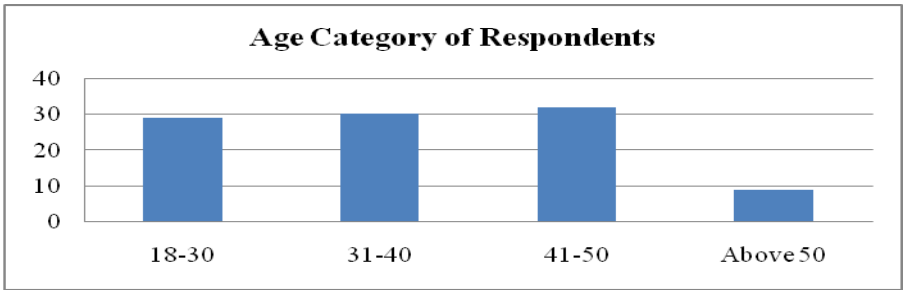

Figure 4.2. Age Category of Respondents

Table 4.3. Respondents' Educational Status

	Frequency	Percent	Cumulative Percent
Basic Education	32	32.0	32.0
WASSCE/Equivalent	39	39.0	71.0
HND/Equivalent	21	21.0	92.0
Bachelor's Degree	8	8.0	100.0
Total	100	100.0	

Source: Survey Data, 2014

On the educational status of the respondents, Table 4.3 shows that 32 respondents representing 32% claimed they had completed primary education while 39 respondents representing 39% claimed they had WASSCE/Equivalent certificate. While 21 respondents representing 21% claimed they had HND/Diploma

certificate, 8 respondents representing 8% claimed they had bachelor's degree. Most of the respondents, from the analysis, have WASSCE/Equivalent certificate. The analysis is further reflected in the bar chart below.

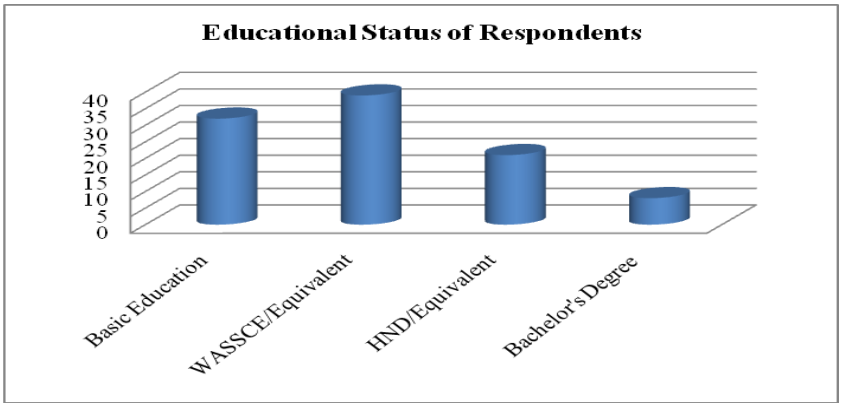

Figure 4.3. Educational Status of Respondents

Table 4.4. Marital Status of Respondents

	Frequency	Percent	Cumulative Percent
Married	61	61.0	61.0
Widowed	18	18.0	79.0
Divorced	10	10.0	89.0
Never Married	11	11.0	100.0
Total	100	100.0	

Source: Survey Data, 2014

Table 4.4 shows that 61 (61%) of the respondents reported they were married while 18 (18%) of the respondents reported they were widowed. Also, while 10 (10%) of the respondents reported they were divorced, 11 (11%) of the respondents reported they were never married. The analysis is further reflected in Fig.4.4.

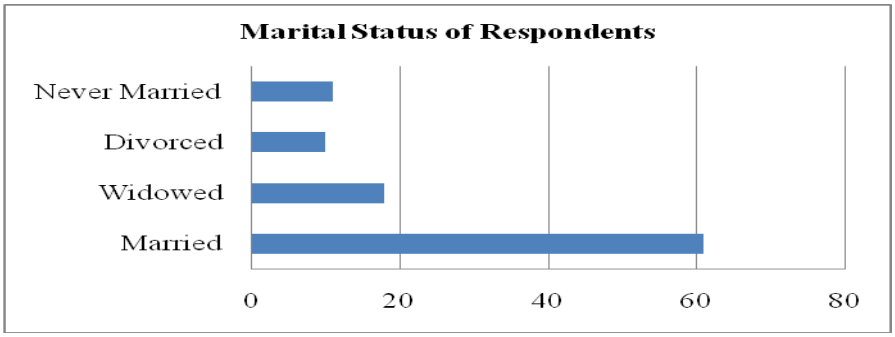

Figure 4.4. Marital Status of Respondents

Table 4.5. Type of Crop Produced

	Frequency	Percent	Cumulative Percent
Maize	51	51.0	51.0
Rice	22	22.0	73.0
Groundnut	16	16.0	89.0
Others	11	11.0	100.0
Total	100	100.0	

Source: Survey Data, 2014

On the type of crop produced, 51 (51%) claimed they produced maize while 22 (22%) of the respondents claimed they produced rice. Also, 16 (16%) of the respondents claimed they produced groundnut

while 11 (11%) claimed they produced other crops (specifically, millet, yam and beans). From the analysis, it is clear that majority of the farmers produce maize. The results are further reflected in Fig.4.5.

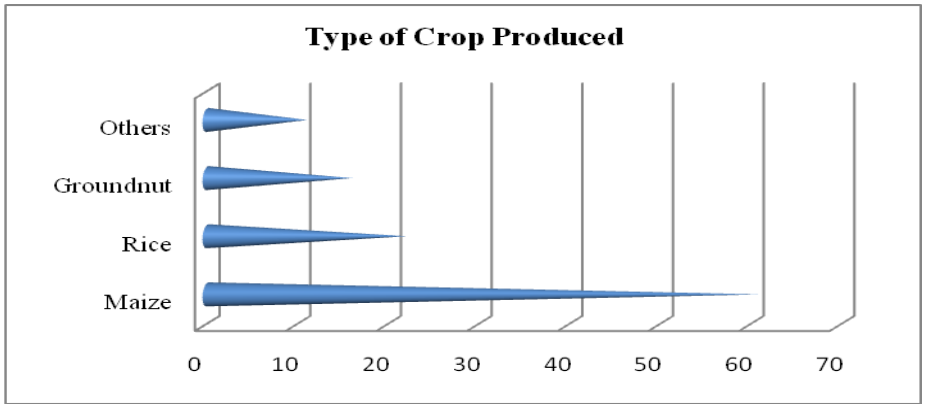

Figure 4.5. Type of Crop Produced

4.3 Relationship between Microfinance and Crop Production

Table 4.6. Amount of Money Borrowed

	Frequency	Percent	Cumulative Percent
Less than 100 GH¢	40	40	40.0
100 GH¢ -200 GH¢	29	29	69.0
201 GH¢ -300 GH¢	21	21	90.0
Above 300 GH¢	10	10	100.0
Total	100	100	

Source: Survey Data, 2014

Table 4.6 shows that 40 (40%) of the respondents claimed they had borrowed less than 100GH¢ from the microfinance institutions for their crop production while 29 (29%) claimed they had borrowed between 100GH¢-200GH¢ for their crop production. Also, while 21 (21%) claimed they had borrowed between 201GH¢-300GH¢ for their crop production, 10 (10%) claimed they had borrowed above 300GH¢.

Table 4.7. Coverage of Microfinance Services

	Frequency	Percent	Cumulative Percent
Very Broad	67	67.0	67.0
Broad	19	19.0	86.0
Narrow	14	14.0	100.0
Total	100	100.0	

Source: Survey Data, 2014

On the coverage of microfinance services, 67 (67%) of the respondents claimed it was very broad while 19 (19%) of the respondents claimed it was broad. However, 14 (14%) of the respondents claimed the coverage of microfinance services was narrow.

Table 4.8. Contribution of Microfinance to Crop Production

	Frequency	Percent	Cumulative Percent
High	56	56.0	56.0
Moderate	30	30.0	86.0
Low	14	14.0	100.0
Total	100	100.0	

Source: Survey Data, 2014

On the contribution of microfinance to crop production in East Mamprusi District (EMD), Table 4.9 shows that 56 (56%) of the respondents claimed it was high while 30 (30%) claimed it was moderate. However, 14 (14%) of the respondents claimed the contribution of microfinance to crop production was low.

In Table 4.10, the researchers sought to establish the relationship between microfinance and crop production. Consistent with the findings in Table 4.9, the first cell in Table 4.10, for example, shows that 48% of the respondents were of the view that if the coverage of microfinance was broad then the contribution of it to crop production would be high. To establish further this relationship, the Chi-square test of independence was employed. The tested hypothesis is stated below:

H_0: ρ=0; there is no relationship between microfinance and crop production in the East Mamprusi District.

H_1: ρ>0; there is a positive significant relationship between microfinance and crop production in the East Mamprusi District.

The result of the Chi-square test showed that there was a statistically significant relationship between microfinance and crop production (χ^2=106.611; p-Value=0.000).

Table 4.9. Relationship between Microfinance coverage and Crop Production

			Microfinance Coverage			Total
			Very Broad	Broad	Narrow	
Crop production	High	Count	48	8	0	56
		Expected Count	37.5	10.6	7.8	56.0
		% of Total	48.0%	8.0%	0.0%	56.0%
	Moderate	Count	19	11	0	30
		Expected Count	20.1	5.7	4.2	30.0
		% of Total	19.0%	11.0%	0.0%	30.0%
	Low	Count	0	0	14	14
		Expected Count	9.4	2.7	2.0	14.0
		% of Total	0.0%	0.0%	14.0%	14.0%
Total		Count	67	19	14	100
		Expected Count	67.0	19.0	14.0	100.0
		% of Total	67.0%	19.0%	14.0%	100.0%

Note: Chi-Square (χ^2) =106.611, DF=4, p-Value=0.000

4.4 To assess the magnitude of the impact of Microfinance on Crop Production

Table 4.10. Impact of Microfinance on Crop Production

	Frequency	Percent	Cumulative Percent
Strongly agree	21	21.0	21.0
Agree	52	52.0	73.0
Not sure	8	8.0	81.0
Disagree	10	10.0	91.0
Strongly disagree	9	9.0	100.0
Total	100	100.0	

Source: Survey Data, 2014

Table 4.10 shows that 21 (21%) of the respondents strongly agreed that microfinance had impact on crop production while 52 (52%) of the respondents agreed that microfinance had impact on crop production. Eight (8) of the respondents were not sure whether or not microfinance had impact on crop production. Also, 10 (10%) of the respondents disagreed that microfinance had impact on crop production while 9 (9%) of the respondents strongly disagreed that microfinance had impact on crop production. In general, majority of the respondents agreed that microfinance had impact on their crop production.

Although the views of the respondents were consistent with regards to the impact of microcredit on crop production, the researchers also used the regression technique to ascertain the exact impact of

microcredit on crop production in the EMD. In order to use the Ordinary Least Square (OLS) regression, the linearity assumption (see Fig.4.6) and normality assumption were assessed. The outcome indicated that the OLS regression model could be estimated. The results of the regression analysis are presented in Table 4.11.

Regression Model: $CP = \beta_0 + \beta_1 MC + \varepsilon_i$ (2)

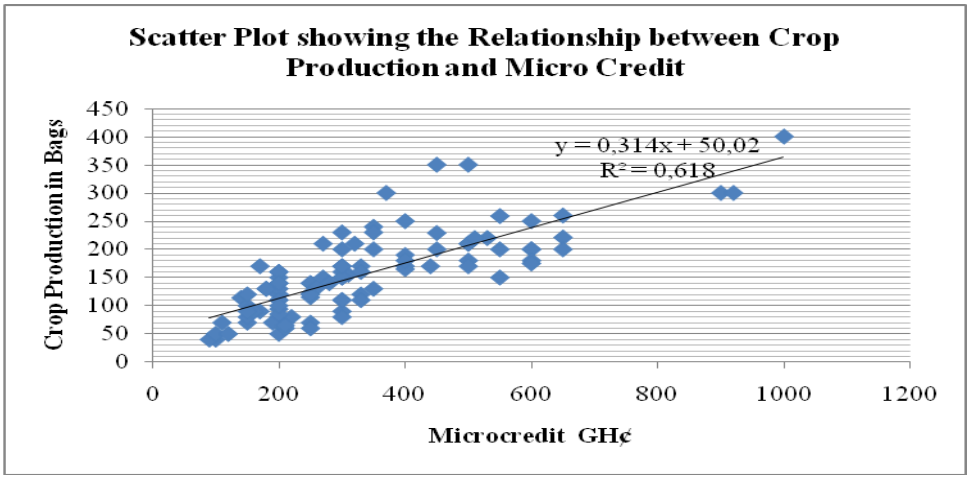

Figure 4.6. Relationship between Crop Production and Microcredit

Table 4.11. Summarized OLS Regression Result

	Unstandardised Coefficients					Standardised Coefficients
	B	Std. Error	t-stat	Sig.		Beta
Constant	50.022	9.380	5.333	0.000	***	-------
MC	0.314	0.025	12.615	0.000	***	0.787
R-square……..	0.619		F-ratio……			159.137
Adj. R-square……..	0.615		Sig……..			0.000
Durbin-Watson……	0.915					
No. of Obs……..	100					

Source: Researchers' Computations, 2014

Note: *** means significant at 1% level of significance and MC=microcredit.

The results in Table 4.11, like that of the Scatterplot (see, for example, Fig.4.6), show that there is a positive relationship between crop production and microcredit. Specifically, the coefficient value on MC implies that, holding other effects constant, farmers' crop production increases by more than one-third of a bag (0.314) for an increase in microcredit by GH¢1. Finally, the results also suggest that the predictor variable (MC) explains 61.5% percent of the variance in farmers' crop production (adjusted R-square), the significance of which is confirmed by the overall test of the goodness of model fit ($F=159.137$, $p<0.001$).

5. Conclusions

The chi-square results show that there is a significant relationship between microfinance and crop production. Also, consistent with the perceptive views of the respondents on the impact of microcredit on crop production, the regression result showed that a GH¢1 increase in microcredit to the farmers would increase crop production by more than one-third (0.314) of a bag. This shows that microcredit has significant impact on crop production. Therefore, farmers who have access to microcredit report higher crop production than their counterparts who do not. The paper suggest future studies on comparative basis study between East Mamprusi District of Ghana (i.e. a northern Ghana district) and any southern district of Ghana to establish whether or not the impact of microfinance on crop production is the same across the northern and southern districts of Ghana.

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