

The Impact of Agricultural Credit on the Adoption of Recommended Technologies

Mercy Asamoah

Cocoa Research Institute of Ghana, Box 8, New-Tafo, Ghana
email: Mrcyasamoah@Yahoo.Com, Cell Phone No.: 00233 243533430

Abstract: The Cocoa Research Institute of Ghana (CRIG) is mandated to provide the cocoa farmer with a package of husbandry practices and technologies for realizing optimal yields and high economic returns under socially and environmentally friendly conditions. Most of these technologies, however, depend on the purchase and use of equipment such as mist blowers and inputs such as fertilizers. Since the bulk of the Ghana's cocoa come from small-scale peasant farmers who have limited resources, majority of them are not able to adopt the innovative technologies as recommended. Major constraints have been identified as high cost of input and the lack of access to agricultural credit. In order to encourage full adoption of recommended technologies, it is contended that the provision of credit, especially, inputs, will have positive impact on farmer's adoption behaviour. The main objective of this study was to examine the relationship between agricultural credit and adoption of CRIG recommended technologies. The study was based on a survey of 240 respondents who were interviewed using structured questionnaires and semi-structured interview guide in the Eastern, Ashanti and Western regions. The results showed that less than nine percent of the respondents had adopted all the four recommendations fully, namely, capsid and black pod control, weeding and fertilizer application. It also showed that all the 'full adopters' had had access to agricultural credit. The majority of respondents could best be described as partial adopters. It is concluded that timely release of agriculture credit is the driving force that can influence farmers' adoption of technologies as a package. It is also recommended that local committees involving chief farmers and representatives of licensed buying companies should be involved in the administration of a well-organized and sustainable credit scheme for cocoa farmers.

Keywords: Adoption, Credit, Cocoa, farmers.

1. INTRODUCTION

Cocoa Research Institute of Ghana (CRIG) has been mandated by Ghana Cocoa Board (COCOBOD) to provide cocoa farmers with a package of high yielding varieties and husbandry practices that could lead to increased cocoa production and provide high economic returns under socio-environmentally friendly conditions to the Ghanaian cocoa farmer. Increased cocoa productivity, however, cannot be achieved through research efforts alone. The availability of inputs at the right time and at prices that farmers can afford is also of paramount importance. Unfortunately, the bulk of the Ghanaian cocoa farmers are small-scale peasant farmers who are limited in key resources for cocoa production. Thus, the majority are unable to adopt CRIG technologies fully. The major

constraint has been identified as the high cost of inputs and the lack of access to agricultural credit as well as high interest rates. In order to encourage the full adoption of CRIG's innovative technologies as a package, it is emphasized that the provision of credit especially, inputs, will have positive impact on farmers' adoption behaviour. The main objective of this study was thus, to examine the relationship between agricultural credit and adoption of CRIG-recommendation, namely, capsid and blackpod control, weeding and fertilizer application and to make appropriate policy recommendations.

2. RESEARCH METHOD

The study was carried out in some selected towns and villages in the Eastern, Ashanti and Western regions of Ghana. These regions were purposely chosen because they are from three major cocoa areas in Ghana with the Eastern region being the oldest Cocoa producing area while Western region is the largest cocoa producing region in recent times. Again, some farmers in these regions were identified to be beneficiaries of agricultural credit provided by licensed buying cocoa companies. Lists of cocoa farmers were collected from two Licensed Buying Companies namely Produce Buying Company Ltd. (PBC) and Kuapa Kookoo Ltd. Using linear systematic sampling technique with a random start, a total of two hundred and forty respondents were selected. Out of this figure, 79.2% were males while 20.8% were females. The respondents were interviewed using questionnaires and semi-structured interview guide. In addition, in-depth and key informants' interviews with selected officials from the Licensed Buying Companies, Rural Banks, Farmer Associations, Chiefs and some Purchasing Clerks were also conducted to get insight into certain behavioural patterns among cocoa farmers. The data was processed using SPSS version 10.

3. RESULTS AND DISCUSSION

3.1 Availability of Credit:

Sidhu and Singh (1995) [1] indicated that credit is the nucleus of the system of farm operations especially, in poor countries. Farmers, primarily, need two types of credit, namely consumption credit and production credit (Brown, 1986) [2]. While maintenance of cocoa farms is carried out over several months in a year, most farmers earn the bulk of their income during the major cocoa season. Unfortunately, they are unable to maintain cash

reserves or savings for subsequent year's farm maintenance due mainly to inadequate income to meet their household expenditure. For optimal yield of cocoa, however, there is the need for a regular farm maintenance, pests and diseases control and fertilizer application and these underscore the need for credit intermediation. However, farmers' access to credit is woefully minimal. In this study, only about 25% had access to some credit while majority (75%) had difficulty accessing credit. Out of those who had difficulty accessing credit, 65% explained that they lacked the requisite collateral security in the form of tangible property and/or bank savings. Another 22% were deterred by the long hours spent in processing documents at commercial banks while 12% lacked confidence and/or did not belong to any farmer association that can support them.

3.2. Impact of Credit on Adoption of the Innovations Under Study:

Adoption was defined in this study as the full use of CRIG recommended technologies as a package, following the correct number of applications, timing and using the right kind of equipment or inputs. Thus, adoption was found to be very low. Only 8.8% of the respondents could be classified as full adopters. This compares well with a study by Donkor et al., (1991) [3] which also found a minimal adoption rate of less than 10%.

However, analysis of the utilization of the individual recommendations showed slightly higher utilization of the individual technologies which is referred to as partial or reinventive adoption in this study. Majority of the non-adopters could best be described as symbolic adopters because they appreciated the technologies but were constrained by financial difficulties.

It is important to note that all the full adopters with the exception of one farmer used credit. Subsequently, the characteristic of the full adopters and the impact of the credit on the adoption is discussed.

3.2.1. Characteristics of the full adopters:

As indicated earlier, only twenty-one (8.8%) farmers had adopted the CRIG recommendations in full. Ten of them were females. The mean age of these adopters was 57.6 years and cocoa was the major source of income for 95.3% of them. These characteristics were not too different from the partial adopters. However, the adopters had had significant contact with CRIG through on-farm trials or through private visit to the Research station and this contact with the CRIG was their source of motivation for adoption of CRIG-recommended technologies in full.

3.2.2. Credit Status of the Full Adopters:

Out of the twenty-one farmers who adopted the recommendations in full, about 95% of them had access to agricultural credit in the form of cash and/or inputs and the other one had cocoa farm as a second occupation signifying the importance of access to agricultural credit.

3.2.3. Credit and Capsid Control:

The data showed that access to credit in the form of inputs significantly encouraged about 69% of the farmers to spray their farms against capsids.

Table 1: Access to Credit and Adoption of Capsid Control

No. of Spraying	Access to Credit		Total
	No	Yes	
0	139	19	158
1	12	5	17
2	14	6	20
3	10	1	11
4	4	30	34
Totals	179	61	240

Actually, 51% sprayed three to four times in the year. On the contrary, only 22.4% of the non-credit beneficiaries could spray their farms the previous year. Table 1 depicts the relationship between access to credit and adoption of capsid control.

It is important to stress that availability of credit alone does not lead to adoption of recommendation, but the type, size and time of credit are also important variables to consider when providing agricultural credit to farmers. For instance, some farmers who benefited from cash credit did not use the credit for the intended purpose. Instead, they diverted them to meet other social needs explaining that the loans were disbursed to them at the wrong time (i.e. when the particular cocoa farm practice had passed). Others said the loans fell short of the intended farm practice's budget and/or that the time for repayment was too short to use it for the purpose of cocoa maintenance. As table 1 further indicates, nineteen farmers representing 31.1% of the credit beneficiaries did not spray their farms. Out of this, ten received the credit in the form of chemicals (i.e. inputs) but, diverted them into their vegetable farms, explaining that the chemicals were insufficient for their cocoa farms. Moreover, due to the short repayment period, they decided that the vegetable farms would rather yield quick returns to help them repay the loans. This rational economic decision is very informative for policy makers and any organisation interested in assisting cocoa farmers.

For the non-credit beneficiaries, adoption was woefully minimal. Only 22% (40) attempted to spray and even that only 7.8% (14) of them could actually spray the recommended number of times the previous year as compared to the 51% of the beneficiaries (Table 1). This to a large extent shows that with the availability of credit at the right time and amount, more farmers can adopt CRIG recommendations than without access to credit.

The type of credit was also positively related to adoption of capsid control. For instance, none of the farmers who received cash did spray, on the contrary, those who received inputs or both input and cash sprayed their farms against capsid. A number of reasons were adduced for not following Capsid recommendation. Prominent among them was the lack of spraying machine and funds (Table 2).

Table 2: Reasons for not following Capsid Recommendation by respondents

Reason	Number of Farmers	% of Farmers
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Lack of spraying machine	33	23.4
Lack of finance	75	53.2
High cost/lack of chemical	14	9.9
Others	19	13.5
Totals	141	100.0

3.2.4. Credit and Weeding:

Regular weeding is an important farm activity for the maintenance of cocoa. It could be done manually or by the use of herbicides (CRIG, Guide No.3) [4]. It is recommended that farmers weed three to four times in a year. One can also use herbicide to complete manual weeding. Like capsid control, agricultural credit was also found to have a positive impact on the number of times that farmers weeded their farms. Although majority of the farmers weeded at least once, access to credit facilitated some farmers to weed the recommended number of times. For instance, 51% of the beneficiaries weeded four times while only 6.7% of the non-beneficiaries managed to weed as recommended.

3.2.5 Credit and Fertilizer Application:

Research at CRIG has proven that fertilizer application together with other farm level sanitation practices is economically beneficial. The analysis revealed that out of the forty-eight farmers who used fertilizer, the majority (68.8%) had access to credit in a form of inputs or both inputs and cash and thus, were able to apply fertilizer on their cocoa farms. However, it is important to note that some farmers had negative attitude towards fertilizer use in cocoa farms. Some of these were aged farmers who thought that the use of fertilizer would force all the potential yield/vigour out of the cocoa tree, a situation which they think can result in declining yields in future. For this fear alone they vehemently refused to adopt the use of fertilizer on their cocoa farms even if it was offered free of charge. This is a typical attitude problem which may be solved only through education and perhaps through results demonstration and sensitization.

3.2.6 Credit and Black Pod Control:

The loss attributable to black pod is estimated at 4.9% - 13.5% (Darkwa, 1973;1984) [5], [6]. Primarily, there are two methods of black pod control namely cultural and chemical methods. However, in severe cases, the chemical control using approved fungicides is the most preferred recommendation. In this study 58.7% indicated that they usually used cultural method, 17.9% of them used chemical control method and 23.8% experienced less black pod incidence and therefore did not bother about it. Out of the forty-three, representing 17.9% of farmers who usually used chemical control method, about 91% (i.e. 39 farmers) actually sprayed and 91% of them had access to credit. This also reiterates the fact that availability of credit motivates adoption of individual CRIG-technologies by farmers.

3.2.7. Reasons for Reluctance to Extend Credit to Farmers:

From the point of view of the financial institutions, a combination of several factors impede their effort and

make financing of agriculture especially, cocoa farming more difficult than financing trading. Some of these are discussed here.

i. Individualism or lack of cooperation and high default rate by farmers. Due to the high risks involved and the history of high default rate, most financial institutions do not find it easy extending loans to cocoa farmers on individual basis. They would have preferred to deal with organised registered farmers but most cocoa farmers are unorganised.

ii. Dependence on rain-fed agriculture and natural disasters such as bush fires. Such natural disasters lead to low or no yields that invariably affect farmers' income leading to their inability to repay loans and subsequently, leading to high default rates among them.

iii. Farmers' negative attitude towards bank or government loans also constitute a problem. Some farmers deliberately refuse to repay bank loans thinking that it is their share of the national cake since the income from cocoa is heavily taxed for socio-economic development.

iv. Fungibility of loans (i.e. multiple uses of loans other than the intended purposes for collection). Credits in the form of cash are often used for multiple domestic purposes instead of the production purpose indicated on loan forms. This does not yield any profit, thus, making it difficult for farmers to honour their productive loan repayment.

For all these reasons, financial institutions deem loans to cocoa farmers as highly risky and thus, fail to grant them loans for farm maintenance.

4. CONCLUSION AND RECOMMENDATION

Based on the results and discussions above, it could be concluded that there is very low full adoption of CRIG technologies of less than 10%. Since the major constraint to full adoption is finance, suitable credit would be a mediating process that would change farmers' adoption behaviour in addition to contact with extension agents. Consequently, the following recommendations are made:

- Availability of Credit Facilities: It is recommended that credit should be made available, especially in the form of inputs and equipment at the right time and in the right quantities to enable farmers adopt CRIG recommendations as a package. Since many such credit schemes have been a failure in the past, it is suggested that social mobilization and group or shared responsibility concept, should be the tool for sustainable credit scheme with the help of COCOBOD and in collaboration with all Licensed Buying Companies (LBC).

- Farmers should be educated and facilitated to form co-operatives and solidarity groups in the local committees. They should then be trained to take cocoa farming as a business entity, trained also in simple business orientation and savings culture by trained personnel to ensure high repayment, wider outreach and sustainable credit scheme. Local committees should consist of chief farmers, representatives of LBCs and the

elected leaders of farmers associations in the local areas. These committees to a large extent, would ensure that farmers do not default repayment by dodging one company to whom they owe to another company. The social mobilization, social capital and sanctions that would be established through formal associations would be enough to ensure high repayment and sustainable credit scheme.

- There is also the need to strengthen the use of the passbook and *Akuafu* cheque system which encourages savings culture at the banks. This is a system where farmers are paid only through the formal banks.

- Another way of solving the credit problem is to encourage Buying Companies to adopt some aged farmers' farms and maintain them on credit. This will ensure high rate of adoption in the cocoa industry. This approach may follow a strategy similar to what is called 'Anambra State Village Adoption Scheme (ASVAS)' in Nigeria where an institution such as a Bank or company adopts a village and all its eligible farmers as its own 'baby project' in terms of provision of all the necessary credit requirements of the farmers with the aim of improving their access to credit, increase productivity and enhance their welfare (Odoemerem, 1992) [7].

- It is also suggested that government subsidises farm equipment such as spraying machines which are very expensive to farmers to serve as incentive since they are the basic equipment which will enable farmers to properly adopt cocoa recommended technologies.

It is strongly believed that if credit is made available, especially, in the form of inputs at the right time and in the right quantities, more farmers would adopt CRIG recommendations in full. It has also been realised that it is not enough to give only the chemicals associated with these recommendations on credit, but most importantly, the spraying machine for applying the chemicals and thus, facilitate easy adoption.

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