International Journal of Innovation and Research in Educational Sciences
Volume 2, Issue 1, ISSN (Online): 2349–5219

Utilization of Cocoa Farm Management Practices by Small-Scale Farmers: The Pressure of Socio-Cultural Factors

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Abstract: **The Cocoa Research Institute of Ghana (CRIG) has over the years developed improved technologies and innovations to increase production to sustain the cocoa industry. These technologies are meant to be fully utilized with the right kind of equipment in order to realize the maximum benefit. However, despite the proven economic profitability of the technologies, certain socio-cultural factors affect full utilisation by small-scale farmers due to many personal and external factors. Some of these factors are farmer goals and their age, the system of labour employment, social obligations, attitudes and perceptions, inheritance system and land fragmentation. In order to encourage full utilization of these technologies, these socio-cultural factors need to be investigated and appropriate recommendations made to impact positively on Ghanaian cocoa farmers' maintenance culture. Thus, this study discussed socio-cultural factors in respect of farmers' farm management culture. A total of 240 respondents were interviewed in the Ashanti, Eastern, and Western regions of Ghana. Results showed that many farmers were aged, had many cocoa farms, large family sizes and perceived full use of CRIG's technologies as expensive for small-scale farmers. Thus, the majority were constrained by lack of funds due to rising cost of social obligations, which ranked first among their priorities. Negative attitudes and perceptions also influenced some of the farmers. Fragmentation and labour systems also affected some farmers. It is thus, recommended that farmer education should be intensified and supported with favourable policies that would motivate them to fully utilize best practices approved for the management of cocoa farms.**

Keywords: **Cocoa, Farm Management, Cocoa Research, Small Scale Farmers.**

1. INTRODUCTION

It is generally acknowledged that agriculture could be revolutionized through the full utilization of highly improved methods of farming. In Ghana agriculture is the backbone of the economy with cocoa as the mainstay. The need for change inagricultural practices is indisputable and is increasingly being recognized (Brown, 1972) [1], in the cocoa sector. In recent times, cocoa farmers have been called to move from low to high technology, which involves the application of fertilizer and full utilization of all other recommended practices to both mature and young cocoa farms. This call, notwithstanding, most small-scale cocoa farmers in Ghana are socio-culturally and economically constrained, thus, making them unable to abide by the packaged recommended technologies by CRIG. The majority of farmers still operate on low technologies and on small-scale levels with small farm sizes. In addition, some personal and socio-cultural characteristics and attitudes predispose them to selective use or non-use of CRIG recommendations as a package. Some of these characteristics are age, farmer goals, size of household, attitude, awareness and perception of the recommendations. Others are inheritance system and farm management practices. Some earlier studies have supported the influence of some of these characteristics on food crop farming, (Arkorhe 1981; Mahmud and Muqtada 1983) [2], [3]. Rogers (1983) [4] indicated that not only do personal characteristics of the individual greatly influence adoption but also influential is the farmers' perceived attributes of the innovation. For instance, the author mentioned complexity and compatibility as two examples of a five-fold definition, which he gave to his concept of adoption. He defined complexity and compatibility as the degree to which an innovation is perceived as relatively difficult to understand and use and the degree to which an innovation is perceived as consistent with existing values, past experiences and needs of the receivers, respectively. Nonetheless, Brown (1981) [5] pointed out that "individual behaviour does not represent free will so much as choices within a constraint set and that it is the government and the private institutions, which establish and control the constraints". There is therefore the need to emphasize institutional framework that could facilitate the adoption of technologies. The objective of this paper was to identify and discuss socio-cultural factors and their influences on small-scale cocoa farmers.

1.1 CRIG's Recommended-Technologies for cocoa farmers

CRIG continues to research and package its research findings in a form of recommendations to cocoa farmers under the supervision and extension of the current Cocoa Health and Extension Division of the Ghana Cocoa Board.The recommendations are that cocoa farmers undertake regular farm maintenance/cultural practices including good farm sanitation, pests and diseases control and application of fertilizer. Specifically, farmers are to:

(a) Control capsids by spraying insecticides four times a year in August, September, October and December using the motorised mist blower and recommended chemicals.

(b) Regular brushing or weeding three to four times a year; or to use weedicide to complement manual weeding

(c) Control black pod by spraying fungicides at least six times at monthly intervals using the knapsack starting in May/June with the on-set of the rains;

(d) Apply fertilizer once a year to enrich the soil at the beginning of the rains (April/May).The question is whether or not farmers are abiding by these 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 purposively chosen because they are major cocoa producing areas in Ghana with the Eastern region being the oldest cocoa producing area while the Western region is the largest cocoa producing region in recent times. Lists of cocoa farmers were collected from three licensed buying companies namely Produce Buying Company Ltd. (PBC) and *KuapaKookoo* limited. Using linear systematic sampling technique with a random start, a total of two hundred and forty respondents were selected. The respondents were interviewed using structured and semi-structured interview guides, with emphasis on informal interviews and focus group discussions. The framework underlying this study is that farmers' current status are determined and highly influenced by their personal characteristics, goals and the social environment within which they operate. All these factors indicated above affect farmers' decision to use or not to use, technologies approved for best cocoa management. Use of recommended cocoa technologies by small-scale farmers could be full, selective or otherwise. However, farmers' decisions could be pressured by external factors such as favourable government policies like bonus, increased extension and price of dry cocoa beans and better system of labour engagement.

3. Results

3.1. Socioeconomic characteristics of respondents

Out of the two hundred and forty respondents.Interviewed 79.2% were males while 20.8% were females. Average age of the cocoa farmers was 56.9 years ranging between 23 and 89 years. However, the distribution of age by gender revealed that on the average female farmers are a little older (59.7%) than male (56.1%) farmers. The average number of children was six but the average household size was larger ranging between three to 33 members including grand children, nephews and nieces. Despite this, the average number of dependents helping farmers was only one. It is important to note that cocoa happens to be their main occupation and major source of income for over 80% of the respondents. The educational level of the respondents was very low as usual.Over 73% of them either had no education, or had only up to primary leveleducation. Only a few had secondary education. All these personal characteristics have serious implications for full utilization of recommendations making them unable to adopt all the technologies as a package.

This main finding seem to support and confirm earlier work by Byerlee and de Polanco (1986) [6] on farmers' stepwise adoption. Their thesis was that farmers adopt in a sequential manner, practicing partial adoption by accepting only a portion of technology more often, although in some cases the full package may be adopted. In this current study, only 8.8% of the respondents adopted the full recommendations. The rest adopted the recommendation partially due to the results above and other socio-cultural factors discussed in the subsequent sections.

4. Discussions

4.1. Aging cocoa farmers

Ghanaian farmers have almost always been old as demonstrated by many earlier surveys (Addo, 1972, 1974; Okali, 1983; COCOBOD, 1995) [7]-[10]. In this study, 66% of the respondents were above 50 years of age. The issue of aging has thus, become a problem for adoption since most of CRIG's technologies are labour intensive and also, depend on the purchase of external inputs. Thus, aging coupled with lack of funds and increased social responsibilities such as children's education and funeral expenditure impede farmers' ability to purchase inputs and to adopt technologies fully.

4.2.Educational level

Education enhances farmers understanding of technologies and facilitates adoption decision. It helps to better appreciate, accept and implement innovations. As indicated earlier, educational level of respondents was low. Consequently, some respondents did not appreciate the need to use only recommended chemicals for cocoa. For instance, it was found that some farmers mixed chemicals meant for black pod and for capsid control together for lack of spraying machine. This is unapproved by the Cocoa Research Institute and is done purely out of ignorance. This also underscores the need to improve farmer education.

4.3.Size of Household

Traditionally, a large household size was cherished by cocoa farm families because of free access to family labour. However, this study revealed that farmers no more have access to this free farm hands as before since children are being sent to school. For instance, although the average household size was ten with the maximum being 33, an average of only one dependant was helping on the farm. In addition, the large household size also increased domestic expenditure thus inhibiting their ability to adopt full package of recommendations for high yields.

4.4.Land related variables

The number of farms per farmer and the varying geographical locations of the farms make good sanitation a problem. For instance, the average total number of farms (different crops) per farmer was three while the average number of sole cocoa farms was two. It was found that 56.3% of the farmers have between three and fourteen farms located at different places. Considering the cost and time involved in farm maintenance in terms of cost of chemicals and labour, the majority of these farmers perceive full adoption of CRIG-recommendations as very expensive and impossible. Thus, the main problems associated with location related variables are time and mo-

ney.

Another issue associated with land is fragmentation. Due to the inheritance system in Ghana, farm lands end up being fragmented to uneconomically small sizes that do not encourage these heirs to lands. Indeed, fragmentation does not encourage large scale cocoa farming and investment. Furthermore, matrilineal inheritance system is usually associated with land litigation, absenteeism and some times lost of interest in inherited cocoa farms leading to mismanagement and or abandonment. One male respondent reiterated that "we no more get the assistance we use to get from our maternal nephews, yet we are forced to comply with an inheritance system that denies our wives and children the right to fully own farms planted on family lands even though they mostly help us ". For this reason some wives refuse to invest in farms planted on husbands' family lands and would rather purchase lands elsewhere to secure their children's future.

4.5. System of Labour employment

In addition to the above, the system of labour employment also has influence on small-scale farmers' behaviour. The contribution of the labourer is as important as the owner farmer and yet, benefits are unequally shared. Primarily, there are four systems of labour employment. They are '*abusa'* labourer *(*labourer who getstripartite division of produce), annual labourer, contract labourer and the daily labourer. Among these, the one that is of interest is '*abusa',* which could also be a land tenure arrangement together with '*abunu'* system (i.e. equal share). The majority of cocoa farms in Ghana operate under sharecropping arrangement. The system of sharecropping, therefore, has serious implications for adoption of technologies. First, due to the problem of aging most farmers employ 'abusa' labourers to assist them. These 'abusa' labourers get paid in kind after the sale of dry cocoa beans, which are usually seasonal or annual. For this reason, they share their time between meeting their basic needs and the maintainance of the cocoa farms. Most 'abusa' labourers, therefore, weed at most, twice a year instead of the four times recommended by CRIG if the canopy has not closed completely. Again, since *abusa labourers* do not have control or decision making powers, they cannot influence decisions to adopt technologies except when the farm owner has agreed. Furthermore, since 'abusa' labourers cannot use the farms as collateral, coupled with the feeling of insecurity during the death of the owners, they usually care less about adopting improved technologies.

On the other hand, the *abunu* system encourages adoption because the labourer has 50/50 share in the produce and/or the land, especially if the farm was developed from virgin forest.

Abunu sharecropping, thus, provides a sense of security, control and access to a passbook for loans and for Ghana Cocoa Board wards' scholarship, which in themselves are motivation to maintain cocoa farms well. In order to boost cocoa production, aged farmers should be encouraged and advised to give their cocoa farms to interested youth who lack access to land. This idea does not only re-distribute

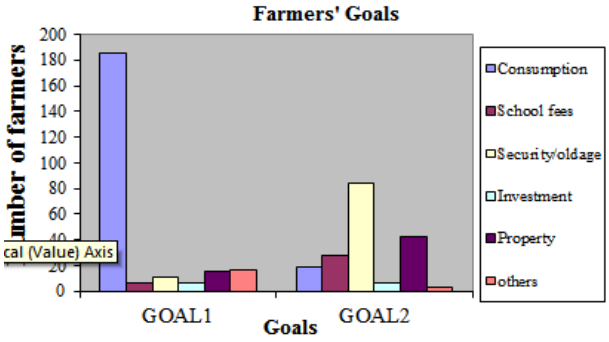

Fig.1. Farmers' goals for cocoa farming

land between the 'haves' and the 'have-nots' but, also, increases motivation to properly maintain cocoa farms to increase yield through adoption of high technology.

4.6.Farmers' Goals

Another personal characteristic that influences adoption behaviour is goals of farmers. Cocoa provides the source of livelihood for many farmers, as over 800,000 farm families depend on it (MASDAR, 1998) [11]. Yet, cocoa farming is seen as a way of life rather than for profit by some farmers. In this respect, consumption, security in old age and acquisition of property featured very prominently in their goals. The figure shows that most farmers enter cocoa farming with social objective rather than with business orientation. Consumption is the first priority/goal for most of these respondents. The implication is that most of these farmers are concerned with current needs rather than others like investment in the farms. To buttress this point, a report by FAO (1986:1) [12] stated that simple assumption of profit maximization as an overriding goal guiding agricultural decisions may not accurately reflect the decision making process of small scale-farmers.

4.7.Farmers Awareness and Perception of CRIG R-ecommendations

Awareness and perception are also important indicators of decision-making process. Rogers (1983) stated that the innovation-decision process begins with the knowledge stage, which commences with exposure to the existence of the innovation and understanding of how it functions.

Perception influences farmers in terms of the attitude they form towards an object, which is full utilization of technologies in this case. From table 1, one can conclude that most farmers are symbolic adopters. They appreciate the value of adoption and yet perceive it to be un-affordable without financial support. For instance, 62.1% and 29.6% of the respondents indicated that capsid control and black pod control are very good but expensive. Similarly, a number of farmers perceive the number of applications to be too many and wished for a review of CRIG recommendations. Apart from cost, it is important to note that some farmers are negative attitudes and would refuse to use technologies even if they are free of charge. For instance, 8.8% of respondents indicated that they disliked the use of chemical fertilizers in cocoa farms not because of high cost but just an inherent dislike of inorganic fertilizers.

Table: Perception of farmers about CRIG Recommendations for cocoa management

Responses	Capsid Freq.	%	Black pod Freq.	%	Fertilizer Freq.	%	Weeding Freq.	%
No response/ don't know	11	4.6	92	38.3	123	54.2	2	0.8
Very good	53	22.1	37	15.4	24	10.6	28	11.7
Good, but, expensive	149	62.1	71	29.6	54	23.8	91	37.9
Too many applications	18	7.5	33	13.7	-	-	57	23.8
Other reason	8	3.33	7	2.9	6	2.6	62	25.8
Do not like it	-	-	-	-	20	8.8	-	-

Aside perception, the study revealed that most farmers are not aware of the individual recommendations, although 73.8% are aware of the existence of CRIG. For instance, only 36.3% are aware that capsid control involves spraying insecticides four times a year in August, September, October and December. As far as weeding is concerned, only 41.3% of farmers are aware of the recommended four times weeding. Weeding twice a year is gradually becoming the norm, due to old age, 'abusa' system of labour and lack of finance as explained earlier. The situation is worse for chemical control of black pod where only 22.9% of the farmers are aware of the recommended spraying of fungicides such as Ridomil 72^{+} six to nine times a year using knapsack. In a similar vein, a significant number of respondents indicated that they did not know that fertilizer is used in cocoa farms at the time of the study. This is different from those who dislike fertilizers. This pre-supposes a knowledge gap between research findings and promotion of technologies, and calls for increased farmer education possibly using the media, which is more effective in reaching the masses.

4.8.Adoption of the individual recommendations

*4.8.1. Black Pod Control:*Cocoa black pod disease is widespread in Ghana. Darkwa, (1973) [13] reported that annual epidemics start in May or early June. Among the control measures being taken are cultural practices, chemical control using fungicide and breeding for resistance. The data revealed that 58.3% of the farmers used the cultural method while only 17.9% used chemical control. This low percentage may probably be due to the low awareness and/or financial constraints.

*4.8.2.Weed Control:*There are two ways in which weeds could be controlled in cocoa farms. The first is manual weeding four times a year and the second is the use of herbicides which happens to be more efficient, labour saving and less tedious. However, due to ignorance and negative perception associated with the chemical and its cost, many farmers have not developed the habit of using it. A couple of farmers had used herbicide in their vegetable farms instead of their cocoa farms. They explained that one could recoup the cost of the herbicide faster in vegetable farms than in cocoa farms. This underscores the importance of observability as noted by Rogers (1983) in adoption behaviour (i.e. *the degree to which the results of an innovation is visible.*

4.8.3. Fertilizer Application: Research has indicated that fertilizer applied in combination with proper shade management, pruning, weed control and insecticide application in cocoa production can possibly lead to the realization of high yields with fertilizer contributing as much as 20-40 % of increase in yield. The commonly used fertilizer on cocoa farms are muriate of potash and triple super phosphate at the rate of 45-90 kg/ha (Adomako et al, 1995) [14]. In this study only 20% of farmers had used fertilizer within the last five years. Apart from those described as symbolic adopters, some farmers have negative attitude towards chemical fertilizer. This attitude could be a function of their perception as mentioned earlier. For instance, some farmers expressed fear that introducing the soil to fertilizer would lead to "fertilizer dependency". Apart from this fear, risk-averse attitude was also found to impede adoption behaviour. Some respondents feared to take risk since cocoa was their main source of livelihood. Lambert and Lambert (1964) [15] indicated that much of our social behaviour is influenced by the attitudes we hold, which in turn, affect our judgment, our perception and our efficiency. For instance, some farmers explained that application of fertilizer would force the cocoa tree to produce above its normal potentials, thus, leading to declining yield in future. This is also a clear indication of lack of education and extension services.

4.8.4. Farmers' Access to Extension Services: Another influencing factor on full use of technologies is effective extension. The survey revealed that more than half of the respondents lacked access to extension services. Only 49.2% had received advice from Extension officers. The rest were getting advice from neighbours and relatives. This lack of extension is probably the cause of low awareness of the recommendations as indicated earlier. This situation does not augur well for proper adoption. For instance, a couple of farmers in the Western region were mixing insecticides and fungicides together to spray their farms, which is a clear case of reinvention. The intension was to use the same equipment, fuel and labour cost to control both capsids and black pod diseases, which was wrong. Such situations are expression of ignorance and lack of knowledge. Many studies have found positive correlation between extension and adoption of innovation (Astu,1974; Sakyi-Dawson, 1999; Gerner H. & Uzo Mok-

wunye,1994) [16]-[18].There is therefore, the need for policy review on cocoa extension to benefit farmers more.

4.8.5.Unintended consequences of government policy: Some government policies such as trade liberalisation of cocoa purchases have had unintended consequences for farmers. Although liberalisation has encouraged keen competition, yet, one of the unintended negative consequences is cash payment for cocoa purchased at the doorstep of farmers. This cash payment has not only affected the *Akuafo* cheque system that encouraged savings culture, but has also introduced theft in the trade such that farmers complain of theft even when their cocoa is being fermented. This is purely a social problem that is gradually becoming an issue worth investigating.

5.Conclusion and Recommendations

Although CRIG has produced economically proven technologies, there is still minimal adoption rate of less than 10%, which also confirms earlier study by Donkor et al (1991) [19]. From the above discussions, more than just economic benefit is needed for a technology to be adopted. There is therefore, the need for equal attention to socio-cultural factors affecting cocoa farmers' ability to fully use CRIG technologies.

Following the discussions above, the following recommendations are made:

The youth must be attracted into cocoa farming through policy incentives such as price increase, bonus scheme, part of which could be inputs. Instituting pension and health insurance schemes for cocoafarmers using their passbooks can also incentivise both aged farmers and the youth. In this respect, re-institution of the 'kilo' deductions from farmers' produce could be the starting point for investment. After a stipulated number of years of faithful contribution by farmers, they could be given benefits in a form similar to formal sector pension scheme.

In addition, Ghana Cocoa Board should intensify extension services to farmers through well-monitored national cocoa farmers' education programmes. The mass media could play a significant role in changing farmers' adoption behaviour as well as exposing them to more results demonstrations.Extension professionals must also be trained to be abreast of the importance of human behavioural aspects, which are less tangible but clearly influence potential adoption of technologies.

Acknowledgement

The Author wishes to express her utmost gratitude to the Management of Cocoa Research Institute of Ghana (CRIG) for the great support. This publication number CRIG/02/2014/044/006 is published by kind courtesy of the Executive Director of CRIG.

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