

Farmers' Management Practices and the Quality of Cocoa Beans in Upper Denkyira District of Ghana

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Abstract: The study was a survey to investigate farmers' management practices to ensure quality of cocoa beans in the Upper Denkyira District of Ghana. Forty cocoa farmers were randomly selected from four communities in the district and interviewed using semi-structured questionnaires. The study showed that the major problems affecting the quality of cocoa beans in the district were financial constraints, pests and diseases, high cost of spraying and incidence of weeds. These accounted for 91.5% of the problems affecting the quality of cocoa beans. The main practices adopted by farmers to ensure high quality cocoa beans were proper drying, regular spraying and proper fermentation. In order to enhance the quality cocoa beans, farmers recommended the provision of credit to farmers, education on post-harvest management practices, and provision of input subsidies. It was concluded that farmers were conversant with the proper management practices and applied very strict measures to ensure quality cocoa beans. Farmers' good management practices accounted for the quality premium enjoyed by the country on the international market. The study recommended that the cocoa mass cocoa spraying exercise should be extended to cover all farmers who currently do not benefit to reduce the effects of pests and diseases.

Key words: Cocoa beans, Ghana, management practices, quality

INTRODUCTION

Cocoa is Ghana's main export crop and the country is renowned for the quality of its cocoa beans leading to a price premium on the country's cocoa on the international market. The crop plays a major role in the national economy in terms of employment, incomes and foreign exchange earnings. In the near future, the socio-economic development of Ghana has been projected to continue to depend on revenue from cocoa exports (Breisinger *et al.*, 2008). It is estimated that there are currently about 720,000 cocoa farmers in the country (Barrientos *et al.*, 2008). But this figure is likely to be an underestimation of the actual number of people benefitting directly or indirectly from the cocoa industry/value chain in the country. Farmers, input suppliers, Licensed Buying Companies (LBCs), Ghana Cocoa Board (Cocobod) with its subsidiaries like the Quality Control Division (QCD), and cocoa processors are all involved in the cocoa value chain making cocoa a major economic crop.

The cocoa sector has deservedly received the most attention from successive governments in an attempt to

increase the country's output levels and foreign exchange earnings. Achieving these goals calls for measures to maintain and possibly increase product quality since quality determines the value of a product (Osei, 2007). The nation has set itself the target of producing one million metric tonnes of cocoa by 2012. A major crop harvest of over 900 metric tonnes in the 2010/2011 season gives indication that the country is likely to reach the target and possibly exceed it.

Reasons for the good performance of Ghana's cocoa sector over the past two decades include prudent policy reforms in the cocoa sector, including the partial liberalization of cocoa marketing but with a strong government involvement in export marketing and quality control. Government involvement in quality control has meant that licensed buying companies cannot adulterate produce sold to Cocobod for shipment. The stringent quality checks at village-level buying centers and take-over points for onward shipment of cocoa beans for export has helped to maintain product quality.

Notwithstanding the good reputation of Ghana's cocoa and the efforts to maintain quality, there are indications that quality can be compromised in the face of

market liberalization. According to Shepherd and Farolfi (1999), the liberalization of markets has brought in its wake new challenges, including how to supply inputs on credit to smallholder farmers and how to maintain produce quality in a competitive market environment. They indicated declines in crop quality as one of the major challenges brought about by export crop liberalization. Experts believe that one of the dangers of liberalization is the lowering of product quality due to competition from buyers to consolidate or increase their market share. For example, in 1997 it was found that pressure from the LBCs in Ghana to obtain cocoa from farmers was giving rise to the sale of some cocoa with high moisture content. This encouraged the development of mould which is one of the most important quality defects of cocoa, and one for which buyers will discount heavily on the international market (Bank of Ghana, 2003).

According to Osei (2007), market-determined premiums in commodity markets are based among other factors on quality perceptions. The author noted that while the quality of Ghana's cocoa has been used as a benchmark for assessing cocoa from other countries, there are always new challenges as the demands of the market keep changing. The buyer, the cocoa processor and the chocolate manufacturer must be satisfied with the quality of the produce that is delivered on the international market. According to Folayan (2010), poor quality cocoa may lead to arbitration cases, loss of market share and revenue as well as tarnish the reputation of the exporting country.

The critical quality issues in cocoa and cocoa by-products market include mould, slaty, bean count, insect damaged beans and other defects in the cocoa beans (Folayan, 1993). Quality is adjudged through flavour, purity, consistency, yield, bean size, percentage shell and fat content all of which influence the choice of cocoa beans (Folayan, 2010). The physical characteristics of the beans and the flavour of the cocoa are major determinants of cocoa quality.

Ghana is able to maintain a high export quality of cocoa because of the established practices of the farmers, who are very quality-conscious (Bank of Ghana, 2003). Cocoa farmers in Ghana are noted to follow stringent management practices that ensure good quality cocoa, a feat in which they take pride in. In preparing his cocoa for sale, the Ghanaian farmer will take great care to sort out the good and bad beans, often discarding most of the bad beans.

The attainment of high quality cocoa beans depends on several factors. It has been argued that 80 percent of the quality of cocoa beans is dependent on the correct growing, drying and fermentation methods adopted by farmers. Problems militating against the achievement of

international quality standards in cocoa are broadly classified into natural factors and structural/financial factors. The natural factors include the effects of weather, sunshine and drying of cocoa beans. The structural/financial factors include: absence of direct extension services; funding of research activities; high levels of chemical residues; presence of heavy metals; use of jute sacks for the export of cocoa; and, mode of shipment. According to Folayan (2010), the root cause of quality anomalies in cocoa could be traced to poor farm management, infestation and other diseases, poor handling, bad fermentation, inadequate drying leading to high moisture content which makes the produce vulnerable to mould and bacterial growth. Other causes of low quality cocoa are poor and long storage time which result in fat degradation, and pest infestation in the absence of fumigation and other forms of quality maintaining measures.

As noted by Osei (2007), the biggest challenge in maintaining the confidence and trust of buyers of Ghana's cocoa is to ensure consistency in the quality of cocoa that the country supplies. According to the author, "this implies that cocoa farmers must continue not only to adhere to and adopt good agronomic practices but improve whatever good cultural practices they are currently applying" (Osei, 2007).

This paper investigated farmers' management practices that help to ensure good quality cocoa beans, the challenges facing farmers in maintaining quality and the measures to enhance the quality of cocoa beans in the Upper Denkyira district of Ghana. The results will be insightful in diagnosing and exposing weaknesses in the quality assurance measures in the Ghanaian cocoa sector so that the country can continue to enjoy its high premium quality status on the international market.

MATERIALS AND METHODS

The Upper Denkyira district is found in the Central Region of Ghana. The district lies in the forest zone and the major occupation of the inhabitants is farming, trading and small scale mining. The district is suitable for cocoa production. Four communities in the Upper Denkyira District were purposively selected for the primary data. These communities are among the major cocoa growing communities in the district.

Forty cocoa farmers were randomly selected from four communities in the district namely Mfoum, Babianeha, Mradan, and Atechem. Ten farmers were selected from each community and interviewed using semi-structured questionnaires. Data were coded and analysed with the aid of the Statistical Package for the Social Sciences (SPSS). The results were presented in the form of tables, frequencies and percentages.

RESULTS AND DISCUSSION

Socio-economic characteristics of farmers: The results of the personal characteristics of the respondents showed that 79% of the respondents were males while 21% were females. Forty five (45) percent of the respondents were aged between 41-60 years while 20% were above 60. Thirty (30) percent were between 21-40 years and 5% were below 20 years. The age structure showed that most of the farmers are ageing. The result showed that cocoa farming in the study area is mostly carried out by male farmers who are relatively old. According to Oluyole and Sanusi (2009), cocoa farming is a tedious job that requires much strength. The relatively old age of cocoa farmers may influence their productivity and decision making (Ogunleye and Oladeji, 2007). The male dominance in cocoa production could also be explained by the fact that men traditionally own lands and have easier access to land in most rural communities.

Thirty (30) percent of the farmers had no formal education. Close to 58% had basic/junior high school education, 5% had senior high school education and 7.5% had tertiary education. The educational level of the respondents was therefore low which could affect the adoption of farming technologies (Pantanal, 1987; Weir and Knight, 2004).

Close to 23% of the farmers have been in cocoa production for 21-25 years while 2.5% have cultivated cocoa for 31-35 years. This showed that most of the respondents have considerable experience in cocoa production. Ogunleye and Oladeji (2007) found that about 75% of their respondents were experienced cocoa farmer with more than 11 years in cocoa production. The relatively long years of farming is likely to enhance their knowledge of cocoa production and post-harvest management practices.

Problems farmers face in ensuring quality cocoa beans: Table 1 shows the problems that farmers face in ensuring quality of cocoa beans. The main problems affecting the quality of cocoa beans in the district were financial constraints, pests and diseases, high cost of spraying and problem of weeds. These accounted for 91.5% of the problems affecting the quality of cocoa beans.

According to the farmers, they face financial difficulties in carrying out the recommended practices to ensure high quality cocoa beans. They singled out the high cost of agro-chemicals and spraying guns needed to spray their farms against pests and diseases. According to Dormon *et al* (2004), the incidence of cocoa pests and diseases in Ghana has persisted and contributed to low yields due to inadequate crop management. Pests such as mistletoe compete with the cocoa plant for water and nutrients thereby reducing output while diseases like black pod also cause malformation of the cocoa pod resulting in the reduction in size of the beans. According to Dormon *et al* (2004), most farmers did not control pests and diseases, attributing this to high cost of pesticides, spraying equipment, and labour.

Respondents indicated that not every farmer benefitted from the mass cocoa spraying exercise instituted by the government and those who wanted to spray their own farms found the cost prohibitive. The farmers noted that when farms are properly sprayed, the pods become free of diseases resulting in high quality beans. Dormon *et al*. (2004) noted that spraying gangs employed by the government to spray cocoa farms were occasionally accused by farmers of doing a poor job. Abankwah *et al* (2010) also argue that the cocoa mass spraying exercise to control pests and diseases has not reached its full potential because it has not been able to fulfill its mandate of ensuring that cocoa farms are sprayed four times a year between July and November.

Associated with the problem of pests and diseases is the problem of weeds. Weeds harbour pests and diseases which affect the quality of cocoa beans. Rising labour cost pose a challenge to farmers' ability to keep their farms clean of weeds, thus compromising the quality of the beans they produce.

Inadequate labour is a problem in cocoa production according to Dormon *et al*. (2004). Farmers identified the high cost of labour as a challenge in ensuring high quality cocoa beans.

Farmers' practices to ensure quality cocoa beans: Farmers sell their cocoa beans directly to licensed buying companies (LBCs) who determine the quality of the cocoa beans before purchase. The marketing clerks randomly select some of the cocoa beans which they split up to

Table 1: Problems farmers face in ensuring quality cocoa beans

Problems	Response (% score)	Rank
Financial constraint	34.3	1
Pests and diseases	28.6	2
High cost of spraying	18.6	3
Problem of weeds	10.0	4
Erratic rainfall	2.9	5
Unavailability of good variety	1.4	6
High cost of labour	1.4	6
Long distances of cocoa farms	1.4	6
Poor health of farmer	1.4	6

Table 2: Farmers' practices to ensure quality cocoa beans

Methods	Response (% score)	Rank
Proper drying	21.9	1
Regular spraying	19.0	2
Proper fermentation	18.1	3
Planting good variety	9.5	4
Regular weeding	9.5	4
Allowing pods to mature well	5.7	5
Quick breaking of cocoa pods	4.8	6
Pruning	3.8	7
Application of fertilizer	3.8	7
Avoiding over-ripped pods	2.9	8
Selection of diseased pods	1.0	9

Table 3: Measures to ensure high quality cocoa beans

Methods	Response (% score)	Rank
Access to credit	50	1
Education on post-harvest management	25	2
Subsidies on inputs	20	3
Formation of farmer co-operatives	5	4

determine the brownness of the beans which is a sign of quality. According to Hagan (2006), low quality cocoa beans show purple colouration, heterogeneous size of beans, off-flavour and off-aroma of beans, diseased beans and presence of foreign materials. These problems are the result of erratic rainfall, pests and diseases, improper fermentation and drying of cocoa beans. Purple colouration, for example, is the result of improper fermentation, a major post-harvest management practice.

Table 2 shows the farmer practices to ensure quality cocoa beans. It was found out that the main methods used by cocoa farmers to ensure high quality cocoa beans were proper drying, regular spraying, and proper fermentation. These practices accounted for nearly 50% of the response of farmers to measures used to ensure high quality cocoa beans. As indicated by Hagan (2006), low quality cocoa beans is the result of erratic rainfall, pests and diseases, improper fermentation and drying of cocoa beans.

Planting of good variety results in uniform-sized cocoa beans while regular weeding deals with weeds that harbour pests and diseases.

Farmers also allowed cocoa pods to properly mature before harvesting to ensure quality beans. In addition, the breaking of cocoa pods was done immediately after harvest to avoid losing product quality.

Pruning, application of fertilizer, avoiding over-ripped pods and selection of diseased pods were the other practices adopted by farmers to ensure quality.

Folayan (2010) identified cocoa quality control measures adopted by cocoa farmers in Nigeria to include adequate farm management practices, timely harvesting of ripped cocoa beans, adequate fermentation of cocoa beans, adequate drying of cocoa, and good storage of well dried cocoa beans.

Farmers' recommendations on measures to ensure high quality cocoa beans: Table 3 shows the

recommendations by farmers on measures to ensure quality cocoa beans. Fifty (50) percent of the farmers suggested the provision of loans to farmers through micro-finance schemes to assist farmers purchase necessary inputs such as spraying guns. This will enable them to spray their farms three times in a year to ensure proper control of pests and diseases. Twenty five (25) percent of the respondents also suggested extension education on proper post-harvest management to enable farmers to produce high quality cocoa beans. Twenty (20) percent of the cocoa farmers suggested subsidies on inputs especially spraying guns. This will reduce the cost of hiring spraying gun and also ensure regular spraying of farms. Five (5) percent of the respondents mentioned the formation of farmers co-operatives as a way of receiving extension education and dissemination of information.

CONCLUSION AND RECOMMENDATIONS

Ensuring cocoa quality is a collaborative effort between different stakeholders in the cocoa industry namely farmers, licensed buying companies, the quality assurance institutions (Quality Control Division of Cocobod), extension service providers, cocoa processors and international buyers. Farmers however play a crucial and central role in ensuring quality cocoa beans through their management practices and post-harvest handling of cocoa beans. Cocoa farmers in Ghana are quality conscious and make great efforts to ensure high quality cocoa beans. Some factors however militate against ensuring quality cocoa beans but these challenges have not stopped farmers from producing high quality cocoa. Liberalisation of internal marketing of cocoa has not resulted in a reduction in cocoa quality in Ghana as was the case in other liberalised cocoa producing countries. Farmers' ability to maintain quality in a liberalised system implies that they are internalizing some costs of

production which will ultimately reduce producers' returns from cocoa production.

It is recommended that all stakeholders in the cocoa industry in Ghana should continue to work hard to maintain and improve the quality of cocoa so that the country can continue to export high grade cocoa to sustain the country's reputation in the international market as well as maintain its premium status.

It is further recommended that farmers should be assisted with credit facilities to undertake weed, pest and disease control to help maintain cocoa quality. Establishing a mechanism by which farmers can assess credit to undertake their management practices promptly will enhance the maintenance of cocoa quality.

In addition, the cocoa mass spraying exercise should be properly monitored to ensure that all farms are sprayed at the recommended regime.

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