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The stake of licence buying companies (LBCs) in the promotion of quality cocoa in Ghana

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Abstract: Ghana as a global bourgeon in cocoa production is attributed as the finest grower of cocoa the world over. Grounded on the cocoa industry's tripartite actors and the fundamental role LBCs play in the domestic supply chain, the study assessed the quality control practices instituted by LBCs in promoting quality cocoa in Ghana. Both qualitative and quantitative methods were espoused in the analyses of responses obtained from a sample size of ninety-five (N = 95) involving 10 District Managers (DMs) and 85 Purchasing Clerks (PCs).

The study espoused major quality control practices (QCPs) which is not limited to constant education and training of farmers on proper fermentation, efficient packaging, storage and haulage of goods in transit, proper drying, and removal of placenta and foreign matter. Also, LBCs constantly provide good storage facilities; pallets, tarpaulins, etc., to cocoa farmers, a practice that increases the financial burdens especially the smaller market shareholders. Again, LBCs ensure that their DMs oblige PCs to present high-quality cocoa beans for grading and sealing to the QCC.

Findings hypothesise that LBCs are fixated on practices that promote physical quality of cocoa beans to the neglect of biochemical and process quality of the

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PUBLIC INTEREST STATEMENT

Ghana as a leader in cocoa production is the finest grower of cocoa the world over. This worldwide recognition has been acclimatized due to strict adherence to laid down quality guidelines and criteria by COCOBOD in Ghana and the Federation of Cocoa Commerce (governs the quality of cocoa traded globally). The domestic supply chain of the cocoa industry is characterized by Cocoa farmers (production arm), Licence Buying Companies, LBCs (purchasing arm) and the COCOBOD (quality checks and exportation). The LBCs have the sole responsibility of buying cocoa beans from farmers which is expected to meet certain quality standards. In meeting these standards, LBCs indulge in practices that ensure quality cocoa management. These practices form the crux of our paper. We discovered that the practices LBCs engage in stretch their operational efforts and also increases their financial burdens to astronomical heights. Our study adds to literature and unravels a trend that is constantly putting LBCs out of business in Ghana.

beans. It is therefore proffered that quality promotional efforts be at par to encapsulate the other cocoa quality types in the domestic supply chain.

Subjects: Agriculture; Agriculture and Food; Nutrition

Keywords: cocoa quality; licence buying companies (LBCs); cocoa districts; quality control practices

1. Introduction

The cocoa industry's unmatched recognition as the mainstay of the Ghanaian economy makes it is a worthwhile industry of inquest (Owusu Ansah, Antwi, & Siaw, 2017). Apart from the cocoa industry's accolade of being the magic wand for dispelling the economic woes of many growing economies, it has the potency of sustaining the livelihoods of millions of people the world over (Anim-Kwapong & Frimpong, 2005). Based on existing figures on cocoa trading exports, Ghana exported 526,761 metric tons of cocoa beans in the 2009/2010 cocoa season, more than the 485,785 exported in 2008/2009 season (Bank of Ghana, 2012). Again, the exportation of cocoa beans amounted 40% of Ghana's foreign exchange earnings, placing second as the largest contributor to export dollars (USDA, Foreign Agricultural Service, Global Agricultural Information Network, 2012).

Free competition is a key element of an open market economy where industry players compete for major shares of the domestic market. It also stimulates economic performance and offers consumers a broader choice of better-quality products and services and at more competitive prices. Bounteous evidence tender that competition becomes a major impediment to small firms in an industry dominated and controlled by a few companies with larger market share percentages (Commodity Risk Task Force, 2002; Owusu Ansah et al., 2017; Tiffen, MacDonald, Maamah, & Osei-Opare, 2004).

It was the Government of Ghana's policy objective that liberalisation and privatisation would improve the operational and financial performance of Ghana's cocoa marketing system so as to ensure higher and competitive producer prices (Laven, 2007). Abdul-Wahid (2012), puts forward that the liberalisation and privatisation of cocoa purchasing seem to have led to declining quality and yield of cocoa, thereby undesirably affecting farmers' and Ghana's earnings in terms of premium payment on the international market. This assertion is buttressed by Lundstedt and Pärssinen (2009), who unravelled that though the quality level of Ghana's cocoa has still been high, there has been a decline in quality since the liberalisation of cocoa purchase. According to Kolavalli, Vigneri, Maamah, and Poku (2012), The major factors that contribute to cocoa quality are high-yielding and disease-tolerant planting material, disease and pest control (both pre- and postharvest), timely harvest of ripe pods, fermentation for a period of six days, adequate sun drying to reduce moisture content to 7.5%, removal of bad beans during the drying process, and appropriate storage of cocoa beans. The dimensions of cocoa bean quality, particularly flavour and colour, depend largely on the planting material used.

According to Cocoa Marketing Board (1947), the Federation of Cocoa Commerce, which governs the quality of cocoa traded globally, grades cocoa as I, II, or substandard. All cocoa traded must be thoroughly dry and free from foreign matter. The three grades are based on percentage of moldy (3, 4 and >4 for Grade I, II and Substandard, respectively), slaty (3, 8 and >8 for Grade I, II and Substandard, respectively), and otherwise defective beans (3, 6 and >6 for Grade I, II and Substandard, respectively). Alternatively, the other dimension of observed cocoa quality is the category based on bean size and weight. The beans are primarily categorized into main and light crop (Ghana Cocoa Board (COCOBOD), 2010).

According to COCOBOD (2010), the standard against which all cocoa is measured throughout the world is that of Ghana's cocoa due to its theobromine and flavonoids high content. This makes it the best cocoa for high-quality chocolates according to COCOBOD in 2011. The premium that Ghanaian cocoa gets because of its quality is estimated to be between 4% and 6% (Gilbert & Tollens, 2003). The International Cocoa Standards (ICS) obliges cocoa of merchantable quality to be fermented, meticulously dried, free from smoky beans, abnormal or foreign odour and any indication of adulteration. Also, it must be reasonably free from living insects, broken beans and fragments, and the beans must be reasonably uniform in size (devoid of admixture).

There is great demand for Ghana's cocoa in the world commodities market and Ghana also receives quality premium that enhances export earnings from cocoa, all due to the quality of cocoa the country produces. However, there have been a lot of concerns raised about the fallen quality standards of Ghana's cocoa in recent times. This revelation spurred the researchers to examine the contributions LBCs make towards ensuring high-quality cocoa in the domestic market. Whereas Abdul-Wahid (2012) wrote on maintaining quality standards in the face of internal market competition in Ghana's cocoa industry, Anim-Kwapong and Frimpong (2005) researched into vulnerability of agriculture to climate change on cocoa production, and Owusu Ansah et al. (2017) wrote on "All because of competition: A bane or blessing for smaller licence buying companies (LBCs) of the Ghanaian cocoa industry". Owusu Ansah et al. (2017) found that competition exists in the cocoa industry but is greatly controlled by LBCs with larger market shares in Ghana. However, these studies failed to consider the role LBCs play in promoting quality of cocoa in Ghana. The focus of the research is to examine the role of LBCs in promoting the worldwide acclaimed standard of the Ghanaian cocoa. This will encompass an assessment of the Quality Control Practices (QCPs) instituted by LBCs in maintaining quality standards of cocoa.

2. Materials and methods

2.1. Research design and setting

The paper was advanced from a thesis conducted between September 2014 and June 2015 to examine the contribution of Licence Buying Companies (LBCs) to the management of quality control practices in the Ghanaian cocoa industry. The study design utilized the mixed method approach to descriptively analyse responses from researchers' administered open and close-ended designed questionnaires. To provide an adequate and robust account of the role LBCs play in promoting quality cocoa in Ghana, the mixed method approach helped to get a detailed account of the respondents on the role of LBCs in promoting quality cocoa in Ghana. The basic qualification for respondents was hinged on their direct employment in a recognized LBC; Regional/District manager and/or Purchasing clerk, involved in the domestic purchasing of cocoa. Figure 1 is a map showing all the notable cocoa districts in Ghana. Table 1 shows the summary of the study' population guide.

2.2. Recruitment and sampling

Table 2 illustrates the quota sampling employed for selecting respondents. The study used stratified random sampling to group the fifteen (15) cocoa districts in the Ashanti region. The simple random sampling technique was adopted in the selection of five (5) cocoa districts; Antoakrom, Nsokote, Konongo, Nyinahin and Asante Bekwai. In selecting PCs, quota sampling technique was employed in the selection of the total 85 respondents from the selected cocoa

Table 1. Population Guide for the study

CML Employees	Population	Sample size
District Managers	10	10
Purchasing Clerks	100	85
TOTAL	**105**	**95**

Table 2. Using quota sampling for selecting Purchasing Clerks (CML, 2014)

Cocoa districts	Population	Sample size
Antoakrom	18	17
Ashanti Bekwai	25	24
Konongo	24	23
Nsokote	16	15
Nyinahin	17	16
TOTAL	**100**	**95**

Source; LBC, 2014

districts. Purposive sampling technique was used to select ten (10) District Managers due to their position and achieved knowledge base on LBC operations and the cocoa industry in general.

2.3. Data collection methods

We employed a one-on-one researcher administered open and close-ended questionnaire design to solicit responses from key informants; Purchasing Clerks (PCs) and District Managers (DMs). This constituted the primary data source. In sum, a total of 10 District managers and 85 Purchasing clerks availed themselves for participation. All questions were designed in the English language, the official language of communication in Ghana. In the case where respondents could not read or understand the English language, we translated to a local language (predominantly, Twi; the language mostly used in Ghana).

The secondary data for the study were sourced from the published information about LBCs and their operations, annual reports and quality management practices. The information covered a period of three years from 2010 to 2016. This category of data was mainly in quantitative form. Access to the data demanded no herculean efforts due to periodic publication of annual reports in the print and electronic media for public consumption.

2.4. Data analyses

Quantitative data were descriptively analysed using the Predictive Analytic Software (PSW, 16) and presented via tables and graphs. Qualitative data was cleaned, coded and analysed using the Attride-Stirling's thematic network analysis framework.

The confidentiality of the information collected from the study participants were considered by ensuring that their names and other information that could bring out their personal identities were not disclosed in the data collected. They were also made to understand their role in the data collection activity and also they were given the choice to opt out if the exercise would affect them in any way.

3. Results and discussion of findings

Based on respondents' socio-occupational physiognomies, majority (60%) were between 20 and 49 years old. According to Ghana Statistical Service (2010), the active working population range is between 15 and 59 years. More males (70%) were involved in the purchasing of cocoa in the selected cocoa districts. Encouraging results were unravelled in terms of respondents' educational attainment as 96% had achieved varied levels of formal education. Abagale et al., (2003) stated that there is a positive relationship between formal education and productivity of labour. The findings, therefore, imply that with majority of respondents' having obtained basic formal education, productivity levels of PCs and DMs is likely to increase since they are able to acquire and possibly apply scientific knowledge in their activities.

Majority of DMs and PCs had achieved between 5 and 10years' experience in the cocoa business and therefore could easily decipher between high-quality standard cocoa beans. Table 3 summarizes the socio-demographic statistics of the study participants.

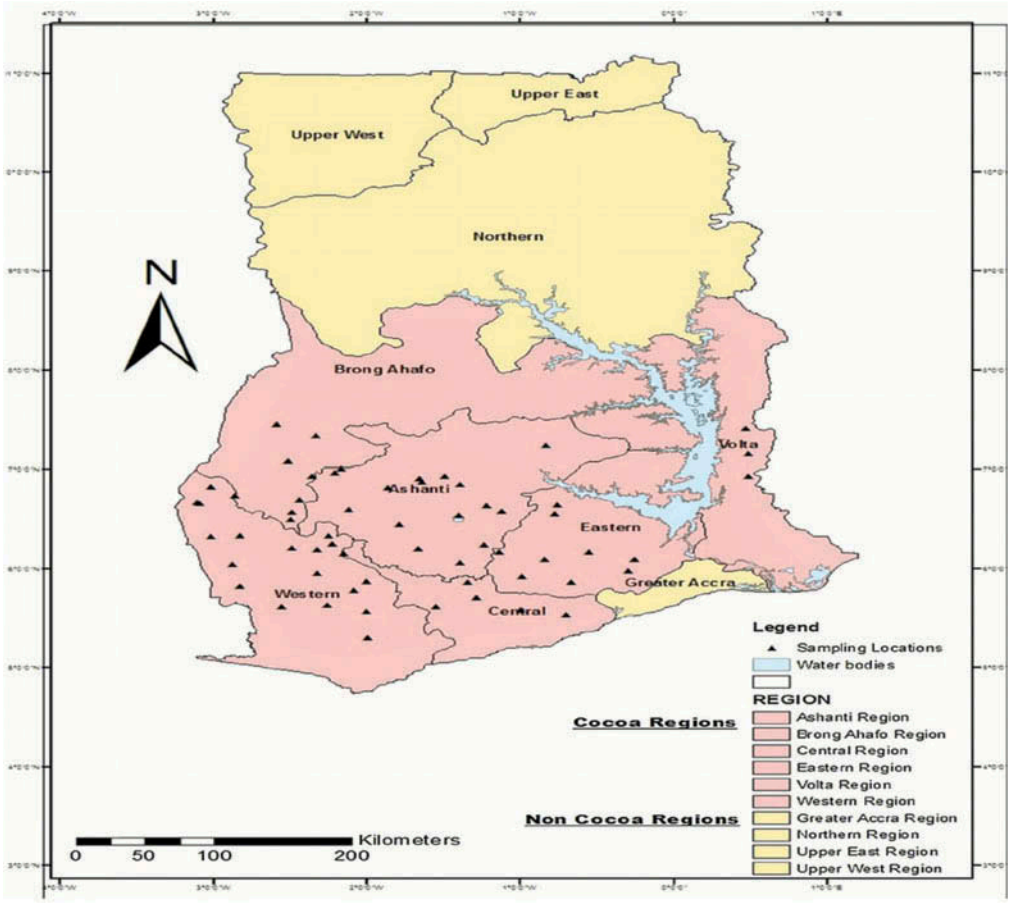

Figure 1. A map of Ghana showing cocoa growing regions Dankyi, 2016.

3.1. Perceptions on the quality of Ghanaian cocoa

Copious evidence proffer that 64% of respondents agreed to the assertion that the quality of cocoa had fallen while 25% believed otherwise and the remaining 10% rendered sceptics. Further assessments revealed that the fallen quality of cocoa could be attributed to the competition among LBCs in the purchase of cocoa. Respondents believed competition was a threat to quality cocoa due to the assertion that, PCs with the aim of buying more cocoa beans to attract higher commissions frequently overlook quality for quantity. Figure 2 illustrates the perceptual views of respondents on the quality of Ghanaian cocoa.

3.2. Quality control practices undertaken by LBCs in Ghana

Figure 3 shows the quality control practices undertaken by LBCs in Ghana to ensure cocoa quality. Quality control in Ghana commences at the farm level and it is discovered that 80% of cocoa quality is dependent on farmers' ability to adopt the correct pre-harvest growing practices, and post-harvest drying and fermentation (MOFEP, 1999, p. 57; BOG, 2003, p. 10). Also, according to Kolavalli et al. (2012), the major factors that contribute to cocoa quality are high-yielding and disease-tolerant planting material, disease and pest control (both pre- and postharvest), timely harvest of ripe pods, fermentation for a period of six days, adequate sun drying to reduce moisture content to 7.5%, removal of bad beans during the drying process, and appropriate storage of cocoa beans. Thus, absolute disregard for any of the factors render the quality of the beans less. Therefore, the study expounded the various practices adopted by LBCs to ensure cocoa quality management in areas of physical, biochemical, process and origin quality according to the International Cocoa Market's (ICM) definition.

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Table 3. Socio-demographic characteristics of respondents

Variable	Frequency	Percentage (%)
AGE		
20–29	14	14.7
30–39	20	21.1
40–49	27	28.4
50–59	20	21.1
60-above	14	14.7
TOTAL	**95**	**100**
SEX		
Male	66	69.5
Female	29	30.5
TOTAL	**95**	**100**
MARITAL STATUS		
Single	16	16.9
Married/Cohabitation	65	68.4
Separated	10	10.5
Widow/Widower	4	4.2
TOTAL	**95**	**100**
EDUC. STATUS		
None	4	4.2
Primary	10	10.5
JHS/Middle School	14	14.5
SHS/Vocational/Tech.	30	31.7
Tertiary & +	37	38.9
TOTAL	**95**	**100**
EXPERIENCE		
Below 5 Years	32	33.7
5–10 Years	29	30.5
11–20 Years	21	22.1
Over 20 Years	13	13.7
Total	**95**	**100**

Source, Field Survey, 2014

Figure 2. Respondents view on the quality of Ghanaian cocoa.

***Source*, Field Survey, 2014.**

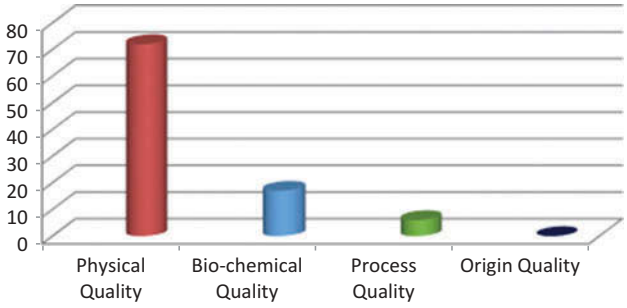

Figure 3. Area concentrations of QCPs.

***Source*, Field Survey, 2014.**

Responses put forward that most of the QCPs were concentrated on ensuring the physical quality of cocoa (75.8%) followed by biochemical quality (17.8%), 6.4% concentrated on process quality. This finding explains the specific type of quality LBCs greatly has the ability to influence. The onus thus lies on cocoa farmers to significantly promote biochemical and process quality since these types commence at the farm level. As earlier explained, LBCs have a higher propensity to apply indigenous knowledge on promoting the physical quality of cocoa beans than ensuring bio-chemical quality or process quality.

3.3. Practices undertaken to encourage physical quality of cocoa bean by CML

This section unearths the major QCPs instituted by LBCs to encourage the physical quality of cocoa. Based on the views and suggestions by both PCs and DMs, the following interventions were uncovered. The reasons for these interventions were premised on the acknowledged importance of quality cocoa bean (71%) in both the domestic and international world market. This acknowledgement by respondents is in line with COCOBOD's vision to "*Encourage and facilitate the production and processing of premium quality cocoa*." Also, according to Wallace, Ghana grows the finest cocoa in the world, thus unsurprising for LBCs to be also obsessed with quality maintenance practices.

Based on the established Grade 1 cocoa bean quality standards, LBCs encourage its PCs and DMs to constantly value cocoa beans with lesser moisture content (7.5% for Grade 1), minimum disease infestations, low defectiveness of beans (less than 3% for Grade 1), uniform bean sizes per bag, low/no moldiness and lesser foreign matter.

The researchers further illuminated the characteristics that define cocoa beans as being of higher quality or otherwise. A question was posed to allude some of the defects which indicate low quality in cocoa. The following cocoa defects were divulged:

Table 4. Major defects of cocoa beans identified by PCs.

Defect of Cocoa beans	Explanation
(1) Not Thoroughly Dry (NTD)	Cocoa beans with great moisture content
(2) Admixture also known as Average Tolerance Level (ATL)	a mixture of cocoa beans of different sizes or a mixture of uneven/unusual beans
(3) Mould	cocoa beans that become moldy, tastes bitter and lacks flavor
(4) Weevil	cocoa beans infested with weevils and cocoons, damaging the food
(1) Purple	cocoa beans in purple color and tasting bitter and flavorless
(2) Foreign material	Cocoa beans mixed with debris, stones, or cow dung etc.
(1) Flat beans	beans that are very light in weight due to smaller food in them
(2) Smoky beans	cocoa beans contaminated with smoke

Source, Field data, 2015 (Abdul-Wahid, 2012)

Table 5. Based on the Attride-Stirling' thematic framework for analysing qualitative responses, the respondents divulged the following ways as pragmatic ways of reducing cocoa bean defects to promote quality in the selected cocoa districts.

Cocoa Defect	Required Restorative Measure
NTD	Re-drying and general bulking of cocoa.
Purple beans	No curative measure and should better be prevented. Cocoa is graded as sub-standard cocoa if purple is high.
ATL/Admixture	Sieving, segregation and hand picking of abnormal beans.
Mouldiness	Re-conditioning if not too serious. Discard cocoa if mouldiness is very serious.
Cocoon infested	Spraying, fumigation, discarding infested sacks and re-bagging cocoa into new sacks.
Germinated beans	Hand picking of germinated beans from normal beans.
Black beans	Hand picking of black beans and general bulking.
Dampness	Re-drying and storing at worm temperature.
Foreign matter	Sieving of cocoa to remove rubbish. Hand picking of all pieces of placenta, sticks, stones and animal excrement;

Source, Field Survey, 2015

3.3.1. Major QCPs undertaken by LBCs to ensure cocoa quality

Table 4 presents the major defects of cocoa beans identified by Purchasing clerks. In an attempt to irradiate the reasons for LBCs concern for quality management practices, the statement below was made to succinctly declare their stance on quality.

"When it comes to cocoa quality, there is zilch you can do about it because if you do not purchase quality cocoa, it will be rejected by COCOBOD….even if it is accepted, they will pay you less…so, for quality, you have to consider the quality standards by COCOBOD'S".

Farmers have the choice of selling their cocoa beans to a number of LBCs or their agents in each cocoa community. Mostly, these LBCs have sheds in the villages where cocoa beans are weighed and farmers are paid according to the weight of their beans. This interaction is a simple spot purchase prearrangement which does not involve the signing of contracts. To ensure high quality, COCOBOD's purchasing rules require LBCs to test the quality of farmers' cocoa beans prior to purchase. A typical role actively performed by majority of LBCs. In general some of the major activities undertaken by LBCs to ensure cocoa quality covered the following;

- Education and training of farmers on proper fermentation of cocoa produce, drying, picking of placenta pieces and foreign matter from beans, good agronomic practices, *inter alia* through organized workshops.
- Ensuring that District managers present good quality cocoa for grading and sealing to the Quality Control Company (QCC) or face rejection.
- Ensuring that Purchasing Clerks (PCs) provide requisite assistance to farmers. Encouraging the use of banana and plantain leaves to cover the cocoa beans in order to give it a fine aroma. Assisting farmers with farm inputs, financial credit, as well as bonanza and award systems for farmers and PCs, to help improve yield and quality;
- Provision of good storage facilities; cocoa district depots, tarpaulins, pallets, etc., to prevent bagged cocoa sacks from absorbing moisture contents from the ground due to the plants' hydroscopic nature. Through the acquisition of warehousing facilities, lorry for transportation purposes, and operational logistics such as weighing scales, tarpaulins, and gratins;
- Prompt payments of salaries and wages of staff associated with maintenance of product quality to serve as a motivating agent towards ensuring good quality cocoa practices;

- Co-operating with COCOBOD and QCC in adherence to regulations in the cocoa purchasing industry especially those related to quality maintenance.

3.4. The state of quality control practices in the face of competition

Tables 5 shows the suggested ways to avoid major defects identified in Table 4. Previous studies suggest that competition among LBCs in the cocoa industry gives larger LBCs undue advantage over those with smaller market shares, especially in terms of giving out extra incentives to motivate farmers to sell to (Owusu Ansah et al., 2017). Fold (2001), recommended that under a free market system the costs of maintaining the quality control system would not be cost-efficient for the private sector, and therefore, Ghana's system of quality control can only be maintained under the COCOBOD's monopoly of exports. Nonetheless, LBCs have instituted measures aimed at ensuring the production of quality cocoa beans for export.

The following were some of the views gathered.

> *As a result of stiff competition between LBCs for farmers' cocoa beans, LBCs have resorted to taking some of the quality related responsibilities like drying and sorting of the cocoa beans. This has resulted in lowering the incentives for farmers to improve on their production practices towards quality.*

The foregoing argument reveals that the competition in the internal market does not favour LBC's operations and therefore strict competitive monitoring is needed in order to avoid the bamboozlement of smaller LBCs in the domestic market. However, when questioned about whether they will reject poor quality cocoa, about 76% of District Managers claimed that PC's would reject poor quality cocoa. This was often qualified with the belief that;

> *'Purchasing low quality cocoa was worthless owing to the watchfulness of the QCD in quality control'*. As noted by one DM.

In lieu of the competitive threats faced by rejecting a farmer's cocoa, an alternative was suggested by one of the PCs that instead of rejecting poor quality cocoa, PC's will now help the farmer recondition the cocoa to an acceptable level of quality. Reconditioning would normally involve additional drying of the cocoa or the separation of good from bad beans. Interviews with DM's also confirmed the practice of reconditioning.

It was also disclosed that DMs constantly encourage PCs to rarely reject a farmer's cocoa for fear of losing out to their competitors, but instead, they would recondition the beans where possible. As observed by one DM.

> *You need a very good relationship [with farmers], especially where there is competition, so you have to build rapport with them and even to the extent of petting them by taking on jobs that normally you would not have done*

With regard to factors that demotivate PCs from burdening themselves with the issue of reconditioning defective cocoa beans, respondents suggested that, due to the degree of urgency in the need to buy cocoa from farmers, PCs are always in a rush and therefore any additional reconditioning work carried out may not receive the time and care that the farmer can give. Findings from the study put forward that, Purchasing Clerks (PCs) face a momentous time constraint due to two major reasons.

(1) Because of the organisational risk associated with the work of PCs, District Managers keep very tight control of any amount of money released to the PC. As such, the PC must account for any money received with physical cocoa in a short period of time.

(2) The PC does not want to devote a large amount of time in cocoa bean reconditioning as this will inexorably decrease the extent of time they can spend in the field competing for more cocoa, and ultimately earn more commissions.

This was revealed by interviewed PCs in the selected cocoa district for the study. The argument put forward then relates to the attitudes of PCs towards recovering defective cocoa beans. It can, therefore, be stated that PCs compromise on quality for quantity and also the higher chances of obtaining higher commissions from the number of cocoa beans bought.

4. Policy implications

The study has implications for policy and practice. This study is critical in ensuring that Ghana's cocoa meets international standards which would go a long way to improve the development in the country. The study has also informed agricultural policy actors regarding the specific role LBCs play in promoting the quality of cocoa in Ghana. This knowledge is critical as it will help to inform agricultural policy decision in the country. This study also has implication for the realization of United Nations Sustainable Development Goal 2 of ending hunger, achieving food security and improved nutrition and promote sustainable agriculture.

5. Conclusion

Generally, most of the quality interventions instituted by LBCs are aimed at ensuring the maintenance of the physical quality of cocoa. The study concludes that LBCs contribute through education and training of farmers on proper fermentation, strictly adhering to quality principles by cooperating with COCOBOD and QCC, provision of storage facilities such as pallets, tarpaulins, storage depots, and provision of expert assistance to farmers through PCs. Also, competition in the internal market of the cocoa industry does not favour most LBCs especially the smaller market shareholders and as such a favourable competitive environment should be created for smaller LBCs to thrive. Also, it is recommended that DMs constantly check the behaviours of their PCs in the cocoa purchasing business so the amount of cocoa waste generated during every cocoa season could be reduced through timely reconditioning.

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