

# **Final Report**

## **Linking Smallholders to Profitable Markets: A Case Study of Selected Cassava Value Chains in Ghana**

by

**Samuel Asuming-Brempong, Alfred Asuming Boakye, John K. M. Kuwornu, and Patrick  
Kojo Ofori**

**Prepared for Michigan State University and Syngenta Foundation for Sustainable Agriculture:  
Strengthening Regional Agricultural Integration Project, Phase 2 (SRAI 2)**

**June 2016**

## EXECUTIVE SUMMARY

The objective of the study was to examine the linkages, opportunities, benefits and challenges, amongst others, in three key cassava value chains in Ghana as a case study. These included:

- (a) Guinness Ghana Brewery Limited (GGBL) – Ayensu Starch Company Limited (ASCo) – Aggregator (MAXPO Transport Services) – Smallholder farmers;
- (b) Accra Brewery Limited – DADTCO-Ghana Limited – Smallholder farmers;
- (c) Accra Brewery Limited – Caltech Limited – Smallholder farmers.

The analysis of the linkages in each of the above value chains is based on transaction-cost economics, and examines key issues that include asset specificity, degree of uncertainty and risk of transaction, frequency of transaction, and externalities/opportunism in contracts underpinning these linkages.

Investments made by brewery firms (Guinness Ghana Brewery Ltd and Accra Brewery Ltd) in the value chains indicate high asset specificity in that their processing plants are specifically designed for the production of beer (including Ruut beer and Eagle beer, which are produced from processed cassava). These assets cannot be redeployed at minimal cost for the production of other products except other beer brands. Like the processing plant, almost all the employees of GGBL are trained specialists in the brewery industry and as such cannot be redeployed without cost (cost of training them for other sectors). The machinery of intermediary firms between breweries and farmers, namely Ayensu Starch Company (ASCo) and Dutch Agricultural Development and Trading Company (DADTCO-Ghana) are highly specific to the processing of cassava (either into HQCS for ASCo and HQCC for DADTCO-Ghana). These are not redeployable and therefore the lack of market for HQCS or HQCC will come at a great cost to the companies. However, investments in trucks by MAXPO TS (transport service provider) can be redeployed for other activities at no extra cost, indicating that they are less specific compared to investments made by other parties in the partnerships. Apart from land, farmer investments are mainly in agro inputs and farm implements. The investments in agro inputs is hinged on the assurance that there is a ready market for cassava roots and are highly specific for that purpose. In case of buyer failure, farmers may lose such investment. For the partnership between Caltech and farmers, the high specificity of the assets (processing plant) purchased by Caltech to produce HQCF explains why the partnership will be sustained since they (Caltech) anticipate high volumes of supply of roots. Caltech's investment in inputs is done in expectation of higher yields (from farmers), which ultimately improves Caltech's business through returns associated with economies of scale in processing HQCF. The equipment for the processing of the HQCF are specialized for the production of the cassava flour and as such cannot be redeployed for any other purpose.

The frequency of transaction between GGBL and ASCo is irregular because in most instances, ASCo is unable to provide the quantity of starch required by GGBL. This has distorted the production and marketing plans of GGBL because of the irregular supply of starch. However, the high and constant demand of cassava from GGBL adversely affects the starch processing plant at ASCo, leading to frequent breakdowns which add significantly to the operational cost of ASCo. The frequency of transaction between MAXPO TS and ASCo is certain such that the former is able to supply the quantity requirement of the latter, and the latter always purchases

all quantities supplied. Even in situations where there is breakdown of the processing plant, MAXPO TS is paid for the service it rendered to keep the relationship. Farmers' supply to ASCo through MAXPO TS is certain, regular and has increased over time due to huge demand for starch by GGBL. Although contractual agreement between ABL and DADTCO-Ghana had been terminated during the study, the frequency of transaction was certain and regular prior to the termination of the contract. This led to farmers making further investments by increasing their acreages under cultivation, in anticipation of meeting demand from DADTCO-Ghana. For Caltech, there is certain, regular and increased frequency of transaction with its partners (buyers and farmers). Most often, the quantities of HQCF produced by Caltech are sold within two weeks. The stability in supply by farmers makes it possible for Caltech to make these necessary investments.

The major risk inherent in the partnership between GGBL and ASCo is the inability of ASCo to always meet the quantity requirement of GGBL. ASCo is also the only producer of HQCS in Ghana and as such GGBL is 'locked-in' the partnership (trade relationship) because it cannot find alternate suppliers of HQCS on the local market. Though not a significant risk to the trade relationship, the future price (i.e. price agreed upon for next contract after expiration of one) offered to ASCo is usually not certain to meet the operational cost and to make profit. The risks or uncertainties in the partnership between MAXPO TS and ASCo are borne by individual parties. Thus, there are no arrangements for risk or uncertainty sharing. For example, any cassava that is supplied before a breakdown of the plant would be paid for whether it goes bad or not. However, MAXPO TS may provide support for the repair of ASCo's plant as security for its own operations since the breakdown of the processing plant directly affects the business of MAXPO TS. There is no uncertainty in the partnership between MAXPO TS and smallholder farmers. This is because there has never been any buyer failure on the part of MAXPO TS.

In general, parties in the partnership between GGBL, ASCo, MAXPO TS and smallholder farmers did not demonstrate any opportunistic behaviour in their dealings with each other. However, to ensure that there was strict adherence to quality and quantity requirements for HQCS meant for Ruut beer are not compromised, GGBL deploys staff to monitor the production processes at ASCo as a way of preventing ASCo from behaving opportunistically by trying to divert the product to the open market or its competitors. The externality (to GGBL) evident here is the unforeseen cost associated with the deployment of its GGBL staff. However, the Caltech-seller (farmer)-buyer relationship has experienced opportunistic behaviour from its seller and buyer ends in the past when some buyers decided to renegotiate the prices for goods (HQCF) delivered. Some sellers - farmers engage in side selling when the prevailing market prices are even slightly higher than what is offered by Caltech. To curb these practices, Caltech incurs additional cost in monitoring to ensure that contractual agreements are respected. In general, the successes of the partnership between the farmers and the buyers stems from ready market, certainty of payment, financial assistance, improved standard of living of the farmers, improved yields and stability of price of the produce. Thus, a reliable buyer assures steady income from cassava production.

Among others, the study recommends the following: There should be restructuring of ASCo and more investment made (by government since ASCo is a public entity) in the processing

plant to make it more efficient. Public policy should seek to support farmers to overcome financial difficulties as regards their production (as evidenced from challenges farmers in partnership with ASCo enumerated). It is expected that support to these farmers will help improve acreages under cultivation which will directly generate employment and increase farmer welfare ultimately. There is need also for the creation of enabling environment which includes provision of public goods like good roads and prompt repairs of road infrastructure to production centres to allow private enterprises in partnership with farmers use their limited financial resources to improve business relationship with clients.

## Table of Contents

EXECUTIVE SUMMARY .....	i
List of tables .....	vi
List of figures.....	vi
SECTION ONE: INTRODUCTION .....	1
1.1 Background.....	1
SECTION TWO: LITERATURE REVIEW .....	3
2.1 Contract Farming: Models and Modes of Payments.....	3
2.2 Importance of Contract Farming.....	4
2.3 Transaction Cost Economics and Vertical Integration .....	4
2.3.1 Introduction.....	4
2.3.2 An Overview of Transaction Cost Economics (TCE) in Comparative Governance Arrangements.....	4
2.3.3 Dimensions of Transaction Cost.....	5
<i>Asset Specificity</i> .....	5
<i>Frequency of Transactions</i> .....	5
<i>Uncertainty and Risks in Transactions</i> .....	5
<i>Externalities or Opportunistic Behaviour in Contract</i> .....	5
SECTION THREE: METHODOLOGY .....	6
3.1 Data Collection and Analysis .....	6
SECTION FOUR OVERVIEW OF THE PARTNERSHIPS UNDER STUDY .....	6
4.1 Guinness Ghana Brewery Limited (GGBL), Ayensu Starch Company (ASCo).....	6
Limited, Maxpo Transport Services and Smallholder farmers .....	6
4.2 Accra Brewery Limited, DADTCO-Ghana Limited, and Smallholder farmers .....	8
4.3 Accra Brewery Limited (ABL), CALTECH, and Smallholder farmers .....	10
4.4 Description of Farmers and Farmer Organizations involved in the Partnerships .....	12
4.5 Key Investments .....	13
4.6 Structure of the Partnerships.....	15
4.7 Key Requirements of the Contracts .....	18
<i>Contingencies, Monitoring and Mechanisms to Resolve Disputes</i> .....	20
4.8 Pricing Strategy and Payment Modalities.....	21
4.9 Risks in the Partnerships.....	22
4.10 Other Important Transactions and Relationships that Supports the partnerships .....	23
4.11 Performance of Partnerships .....	24

<i>Successes of the Partnerships</i> .....	24
<i>Challenges of the Partnerships</i> .....	25
4.12 Key Lessons Learned.....	26
SECTION FIVE: KEY FACTORS DETERMINING TRANSACTION COSTS IN BUYER – FARMER PARTNERSHIPS STUDIED .....	27
5.1 Assets Specificity.....	27
5.2 Frequency of Transaction .....	28
5.3 Degree of Uncertainty and Risk in Transaction.....	28
5.4 Externalities or Opportunism in Contracts .....	29
SECTION SIX: CONCLUSIONS AND RECOMMENDATIONS .....	30
6.1 Conclusions.....	30
6.2 Recommendations.....	31
REFERENCES .....	34
LIST OF APPENDICES.....	39
APPENDIX 1 .....	39
APPENDIX 2 .....	42
APPENDIX 3 .....	45
APPENDIX 4: SWOT ANALYSIS OF PARTNERSHIPS .....	49

**List of tables**

Table 1: Production of Cassava in metric tons in Ghana (mt) 2011 – 2014..... 1

Table 2: Average Yield of Cassava (mt/ha), 2011-2014 ..... 2

Table 3: Summary Statistics – Socio-demographic characteristics of Farmers..... 13

**List of figures**

Figure 1: Schematic diagram of the relationship between involving ASCo, MAXPO TS..... 8

Figure 2: Schematic diagram of the relationship between ABL, DADTCO-Ghana and.... 10

Figure 3: Schematic diagram of Buyers (ABL, others), Caltech, and Smallholder..... 12

## SECTION ONE: INTRODUCTION

### 1.1 Background

Cassava (*Manihot esculenta*) is a primary food security crop in Africa because of its ability to withstand drought and plant disease as well as the ease associated with its planting with regards to low labour requirement. Some of the key characteristics of the crop include how efficient it produces carbohydrates, tolerates drought and performs in marginal soils. It is highly flexible in relation to the timing of planting and harvesting (Prakash, Undated). It is thus classified as a famine reserve crop. Cassava is known as a food crop which can be exploited in an attempt to reduce food insecurity and speed up poverty eradication (Guy, Westby & Collinson, 1998). It is also the third most important source of calories in the tropics after rice and maize, and an important source of dietary energy. Millions of people depend on cassava in Africa, Asia and Latin America. The crop is an important part of the diet of more than half a billion people and provides a means for living for many farmers, processors and traders worldwide (Prakash, *ibid*).

In Ghana, cassava is considered as one of the important staples, providing food, feed and economic support to the rural population through farming. It is actually the most important crop in terms of caloric intake and per capita consumption in Ghana. In 2012, cassava contributed 22% of the Agricultural Gross Domestic Product in Ghana, making it the largest contributor. It is cultivated nationwide (save for two regions – Upper East and Upper West, which have insignificant production), but is particularly abundant in Central, Eastern, Brong Ahafo, Volta, and Ashanti regions. Cassava production increased from 11,351,000 mt in 2008 to 16,523,661 mt in 2014, representing a 45.6 % rise (Table 1)

**Table 1: Production of Cassava in metric tons in Ghana (mt) 2011 – 2014**

Region	2011	2012	2013	2014
Western	556,700.00	717,474.27	939,600.00	972,353.39
Central	1,976,946.20	1,764,241.45	1,792,000.00	1,900,009.92
Greater Accra	71,863.00	73,883.70	76,800.00	109,912.03
Volta	1,660,006.64	1,276,089.20	1,443,300.00	1,350,633.30
Eastern	3,858,148.75	4,164,012.62	4,278,000.00	4,414,524.04
Ashanti	1,900,443.80	2,231,907.56	2,384,500.00	2,608,262.10
Brong Ahafo	2,883,352.57	2,949,838.28	3,668,000.00	3,797,416.00
Northern	1,333,406.40	1,369,831.49	1,533,400.00	1,370,550.14
Upper East	-	-	-	-
Upper West	-	-	-	-

*Source: Mofa Facts and Figures 2015*

Average cassava yield in Ghana ranged between a low of 7.6 mt/ha in the Western Region and 23.52 mt/ha in the Eastern Region between 2011 and 2014. National averages of cassava productivity have shown a steady increase since 2011, moving from 14.64 mt/ha to 17.37 mt/ha in 2014 (Table 2).



**Table 2: Average Yield of Cassava (mt/ha), 2011-2014**

<b>Region</b>	<b>2011</b>	<b>2012</b>	<b>2013</b>	<b>2014</b>
Western	7.60	9.04	12.00	11.28
Central	16.17	15.70	16.00	16.20
Greater Accra	10.66	11.53	12.00	16.11
Volta	15.78	5.03	17.00	15.77
Eastern	20.72	22.35	23.00	23.52
Ashanti	15.64	17.78	19.00	20.13
Brong Ahafo	15.59	16.08	20.00	20.09
Northern	14.93	15.19	17.00	15.86
Upper East				
Upper West				
<b>Year average</b>	<b>14.64</b>	<b>15.34</b>	<b>17.00</b>	<b>17.37</b>

Source: MoFA Facts and Figures, 2015

Cassava is prepared and consumed in the country in several forms. The most significant products include granulated and roasted cassava (cassava grits called *gari*), boiled and pounded cassava (*fufu*), cassava chips, cassava flour (fermented or unfermented) and dried cassava (*konkonte*).

Decades of agricultural policies in developing economies and Africa for that matter have focused extensively on increasing crop production through the adoption of modern and best agronomic practices. There has been very little or no emphasis on how to coordinate the activities of value chain actors to ensure that food moves from the farmer to the final consumers in a more systematic and sustainable way. To some extent, the objective of increasing production has been achieved but with little success due to inability to achieve increased income and improved standard of living of the rural poor who are mainly smallholder farmers. Generally, smallholder farmers do not meet the standards required by big multinational retail outlets and processors due to lack of coordination among the various actors in the value chain. This has led to high post-harvest losses among smallholder farmers at both the local and global levels, which otherwise would substantially hasten the growth in their incomes and improve their standard of living.

## **1.2 Study objective**

A key outcome of the need to assist smallholder farmers in gaining substantial increases in income and improve their standard of living is that policy makers more and more seem to prioritize the need to increase the income of smallholder farmers through contract arrangements and other forms of vertical alliances in food supply chains. Numerous studies have examined the forms of partnership and arrangements beneficial to both smallholder farmers and large companies and industries in the agricultural value chain in both developing and developed economies (Kuwornu *et al.*, 2010; Kuwornu *et al.*, 2009ab; Kuwornu *et al.*, 2005ab; Kuwornu *et al.*, 2004; Martin, 1997; Knoeber and Thurman, 1995). Recently, there

has been renewed interest in agricultural investment and partnerships with the intention that such arrangements would undoubtedly promote coordination and credibility among actors in the supply chains. In order to explore these, this study uses transaction-cost economics to examine the type of contractual arrangements that are often employed at a given vertical stage in any particular value chain to reduce the combination of transaction and production costs of the actors involved. In particular, it seeks to examine the linkages, opportunities, benefits and challenges in three key cassava value chains in Ghana, namely:

- Guinness Ghana Brewery Limited (GGBL) – Ayensu Starch Company Limited (ASCO) – Aggregator (MAXPO Transport Services) – Smallholder farmers
- Accra Brewery Limited (ABL) – DADTCO Limited – Smallholder farmers
- Accra Brewery Limited (ABL) – CALTECH Limited – Smallholder farmers

## **SECTION TWO: LITERATURE REVIEW**

### **2.1 Contract Farming: Models and Modes of Payments**

According to Vermeulen & Cotula (2010), contract farming is a form of vertical integration which describes a pre-approved supply arrangements between farmers and buyers. A more complete definition adopted by Prowse (2012) describes contract farming as a contractual arrangement for a fixed term between a farmer and a firm agreed verbally or in writing before production begins, specifies one or more conditions in terms of production and marketing, offering the firm exclusive rights and legal title to the crop. There are two forms of contract: a *production contract* where the producer is provided with inputs such as seeds, insecticides, fertilizers, technical support including others inputs by the buyer, and a *marketing contract* which involves collection and sale of the produce without the active involvement of the buyer in production (Zhu, 2007). Notwithstanding, in contracts where there are no supports, the producer may decide not to follow the recommended practices and buyer may have the option to reject produce that does not meet specified standards. This increases the risk in future transactions. Glover and Kusterer (1990) report that farm contracts have a ‘honeymoon’ period in their first season where smallholders show high levels of goodwill towards the contracting firm.

Contracts may either be long-term which last for more than a year, or short-term in which case it may only last within a year. According to Zhu (2007), 82.3 percent of contract farming in China are short term. This may be as a result of risk and uncertainty in human behaviour and production conditions. There are various pricing strategies often used in contracts. They include the flexible price strategy, the price floor strategy, and the fixed price strategy. The choice of each of these strategies depends on the pricing policy agreed during the contract and the nature of product being traded.

## **2.2 Importance of Contract Farming**

Some studies have shown that arrangements such as contract farming have brought significant benefits to those who participate in them. For instance, Bellemare (2015) revealed that farmers who participate in contract farming have experienced increased incomes. This is as a result of stable prices offered by buyers (marketing firms) and low post-harvest losses due to ready market provided by these firms. Huddleston and Tonts (2007) share a similar view that partnerships with smallholder farmers have led to improvements in farmers' incomes and socioeconomic conditions. In recent times, there has been a shift in agricultural development strategies that seem to focus primarily on those that are strongly associated with participation in value chains at all stages from production to the final consumer (MoFA, 2015). The idea is that in following a consumer-oriented strategy, the smallholder farmers will become more competitive, producing quality products that can compete satisfactorily with any other product (of the same nature) from any other part of the world. These partnerships or collaborations allow these large firms or businesses to provide capital, inputs such as agrochemicals, technology and markets that might otherwise not be available to the smallholder farmers. Farmers' incomes will increase because they are able to access wider markets and they are able to meet the required standards.

## **2.3 Transaction Cost Economics and Vertical Integration**

### **2.3.1 Introduction**

Transaction cost economics (TCE) is widely used as a tool responsible for investigating and dealing with business issues that are crucial to the subsistence of modern businesses (Williamson 1975, 1993b, 1995) and exploring the various options of governance arrangements in markets. Basically, its premise is on the fact that the costs of conducting transactions could be too high; therefore organizing this transaction in the firm presents an improved alternative to the open market system. TCE is very useful for value chain analysis in forecasting seller-buyer relationships. According to Williamson (1985), the TCE approach to economic exchange is based on four central dimensions that characterize transactions, including the degree to which transaction-specific assets are incurred, frequency with which transactions recur, degree of uncertainty involved in transactions, and degree to which one trading partner can impose externalities or opportunism on the other.

### **2.3.2 An Overview of Transaction Cost Economics (TCE) in Comparative Governance Arrangements**

The theories of vertical integration vary. Meanwhile vertical integration tends to be centered on the contradiction in decision of whether to make or buy through the market. From a TCE perspective, it must be realized that there are a wide range of market-based governance arrangements that present alternatives to both spot market transactions and vertical integration. (Joskow, 2003). In this respect, governance structures and arrangements are selected in an attempt to minimize inefficiencies accompanying both ex-ante investment and ex-post performance of partnerships.

### **2.3.3 Dimensions of Transaction Cost**

#### ***Asset Specificity***

In agricultural production, vertical coordination may be preferred by the parties via production contracts to vertical integration in dealing with the problem of highly specific assets under uncertainty. Asset specificity may bring partner firms together by making it costly to engage in other transaction activities in the supply chain. Asset specificity may involve specialized equipment and facilities, as well as specialized training and experience, which cannot yield any substantial profit outside the contract (Williamson, 1985) and cannot be transferred easily to another chain (Anderson and Weitz, 1986). Parties may become devoted to improving the trade relationship when asset specificity involved is high (Parkhe, 1993). Supplier firms may finance a specific asset as a way of showing respect and loyalty to the buyer firm in the contract (Mishra *et al.*, 1998). Similarly, specific investment commitments by buyer firms will also ensure a more secured relationship and persuade suppliers to assure quality for their buyer firms.

#### ***Frequency of Transactions***

The frequency of transactions is very relevant, since it is difficult to recover the cost in specialized governance structures of few and non-recurring transactions (Williamson 1979). This suggests that as transactions increase in frequency, supplier firms have more incentive to invest and to commit themselves to a strong, long-term contractual arrangement beneficial to all parties involved. This is because the transactions cost are recurring and very practical to establish an order (management system) in the supply relationship.

#### ***Uncertainty and Risks in Transactions***

Uncertainty refers to the inability of the parties to tell consistently the imminent actions of the other party in a contractual agreement. External uncertainty relates to inconsistencies in the market because of frequently changing technology, frequent variations in price, or adjustment in service and demand requirements (Achrol *et al.*, 1983). On the other hand, internal uncertainty is about the difficulty of getting or understanding information concerning a role or function. Aldrich (1979) reported that external uncertainties make it impossible to predict eventualities while internal uncertainties make it more challenging to specify outcomes and measure performance (Alchian and Demsetz, 1972). Hence, uncertainty creates transaction cost and grounds for parties to dishonour contractual arrangements.

#### ***Externalities or Opportunistic Behaviour in Contract***

The existing literature reveals that there are two key underlying assumptions of TCE, namely: bounded rationality and externality or opportunism (Rindfleisch and Heide 1997). Usually, high transaction costs are incurred when high specific assets are invested or opportunistic behaviours are observed in the seller-buyer relationship (Grover and Malhotra, 2003).

## **SECTION THREE:            METHODODOLOGY**

### **3.1 Data Collection and Analysis**

The study used both primary and secondary data. Primary data was gathered through interviews and discussions with Key Informants (KI), focus group discussions (FGDs) and interviews with individual farmers by means of structured questionnaires. Primary data also included personal observations made by the research team during fieldwork. The secondary data included statistics on cassava production from the Ghana's Ministry of food and agriculture (MoFA)

Three partnerships were studied and include Guinness Ghana Breweries Limited (GGBL), Ayensu Starch Company Limited (ASCo) – MAXPO Transport Service (MAXPO TS) and smallholder farmers in the partnership; Accra Breweries Limited (ABL) – Dutch Agricultural Development and Trading Company (DADTCO) and smallholder farmers in another relationship; and Accra Breweries Limited (ABL) and Caltech and smallholder farmers in the third partnership studied. Focus group discussions were used to validate the information provided by the individual farmers interviewed. The data thus obtained were compiled and analyzed.

## **SECTION FOUR    OVERVIEW OF THE PARTNERSHIPS UNDER STUDY**

### **4.1 Guinness Ghana Brewery Limited (GGBL), Ayensu Starch Company (ASCo) Limited, MAXPO Transport Services and Smallholder farmers**

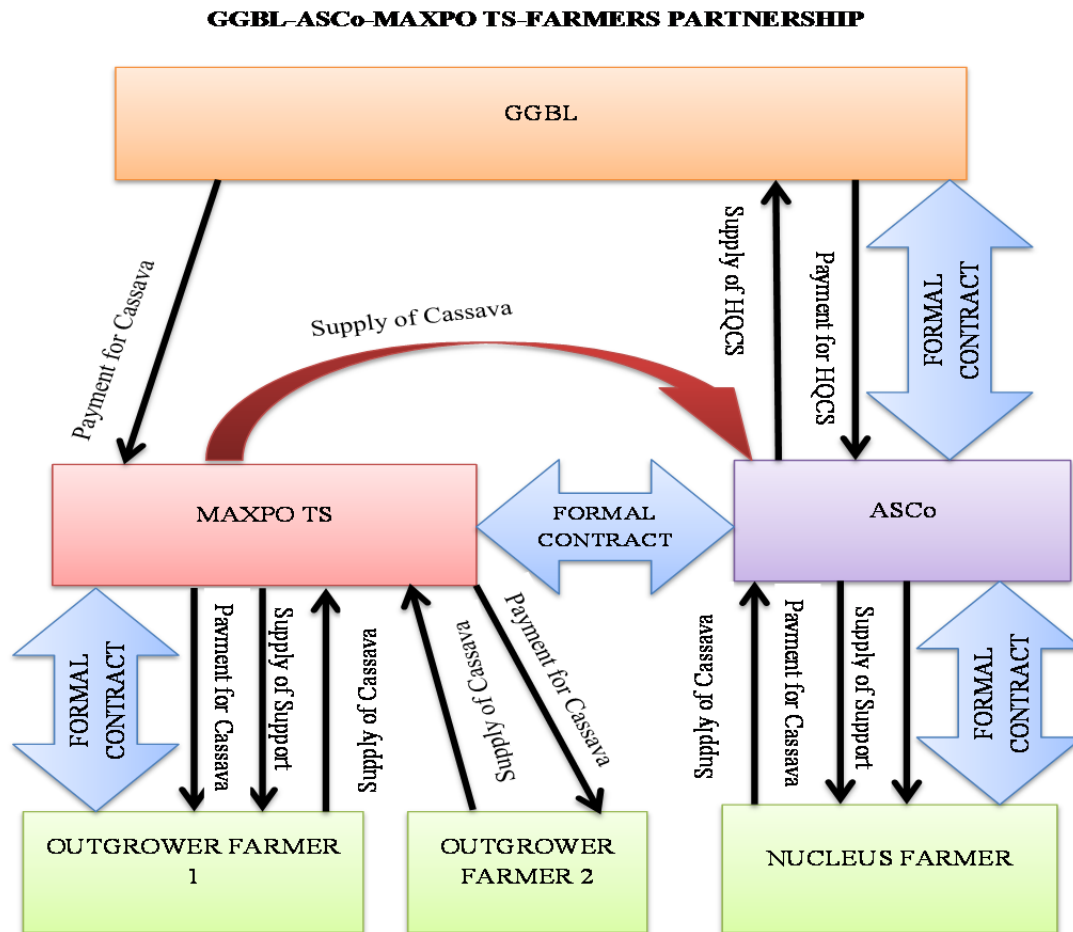
Guinness Ghana Brewery Limited (GGBL) is a multinational company in Ghana originally incorporated in 1960 as Guinness Ghana Limited (GGL) and owned by Heineken International. In 1997, Heineken acquired Kumasi Brewery Limited (originally owned by United African Company) and merged the operation with its Achimota Brewery Limited. The new entity from the merger was called Ghana Breweries Limited (GBL). In 2004, GGL acquired 99.7 percent shares in GBL. The two operations became Guinness Ghana Breweries Limited (GGBL). Heineken currently owns 20 percent of the shares in GGBL, while Diageo is the majority shareholder. It currently has branches located at Achimota in Greater Accra Region and Kaasi (near Kumasi) in the Ashanti Region. GGBL produces more than 14 brands of alcoholic and non-alcoholic beverages. Less than 10 percent of its business and income is dependent on High Quality Cassava Starch (HQCS). The HQCS is used in the production of Ruut beer. In general, 2.5 mt of HQCS (on dry-matter basis) yields about 35,000 liters of beer. GGBL employs about 600 workers in all categories (managers, contractors, production and laboratory technicians, drivers, etc.). It is not directly involved in primary production of cassava but plays a facilitating role to ensure that there is no distortion in the processing of cassava into HQCS which is the primary material for the production of Ruut beer.

In order to ensure sustainable supply of HQCS for production of its Ruut beer, GGBL has partnered with Ayenso Starch Company Limited (ASCo) – a publicly owned industrial cassava processing plant established in 2002 and commissioned in 2004. It was established to address

the glut associated with the annual harvest of cassava in the country and to provide a ready market for farmers involved in cassava cultivation. In this way, the loss of income due to post harvest losses was expected to be eliminated or reduced to the barest minimum. ASCo has a large ultra-modern HQCS processing plant in the Awutu Senya West District of the Central Region of Ghana. ASCo processes cassava roots into HQCS for both domestic and international markets. ASCo through the government of Ghana has also acquired some 200 hectares of land for a nucleus farm project to supply cassava roots to the factory. The company is currently supported by GGBL with funding for its operational cost and in turn, ASCo sells 99 percent of its output to GGBL. The company has one truck, two vehicles for staff and management, one large factory building, one office complex for management and two tractors. As a result of the partnership with GGBL, it (GGBL) has invested about one million US Dollars (US\$1m) into ASCo for running its recurrent expenditure. GGBL also facilitates transportation of roots from the farm gate especially those outside the catchment area of ASCo by linking MAXPO Transport Services (MAXPO TS) to ASCo. (i.e GGBL does not contract directly with MAXPO TS but only plays a facilitatory role between ASCo and MAXPO TS). According to MAXPO TS, the trucks for transportation of roots are re-deployable at no cost. The partnership recognizes that GGBL does not assume the liabilities (indebtedness) of ASCo prior to initiation of the partnership. For instance, ASCo is responsible for a debt of US\$ 68,000 which has consequently resulted in intermittent power supply by Electricity Company of Ghana (ECG).

To avoid any delays in the delivery of cassava to ASCo for the production of HQCS for onward supply to GGBL, ASCo has also partnered with MAXPO Transport Services (MAXPO TS), a company whose sole responsibility is to act as an aggregator and transporter of cassava roots from farmers to ASCo. The concept of aggregators was introduced by GGBL because ASCo was finding it difficult to process the cassava starch and at the same time assemble the roots from the farmers. ASCo accepted the concept of partnering with the aggregator because this arrangement would allow ASCo to concentrate on its core business of processing the cassava into starch. With regards to the partnership with ASCo and farmers, the business is solely dependent on the availability of cassava roots. MAXPO TS works closely with both block/nucleus and out-grower farmers linked to ASCo and delivers 100 percent of cassava roots aggregated to ASCo. Its operations in delivering roots to ASCo extend to all parts of Ghana. To achieve this, it has informal agreements with sub-aggregators who help in assembling roots. However, the transportation of roots assembled by sub-aggregators is still done by MAXPO TS. MAXPO TS has a head office building in Accra and a rented office in Bawjiase (where ASCo is located) where it meets farmers for payments and other business. It employs three people and one is a female youth (18-25 years). The partnership with GGBL and ASCo was initiated in 2014 and is still working.

**Figure 1: Schematic diagram of the relationship between involving ASCo, MAXPO TS and Farmers**



#### **4.2 Accra Brewery Limited, DADTCO-Ghana Limited, and Smallholder farmers**

Accra Brewery Limited (ABL) is part of a multinational group of companies in Ghana located at Accra Central Business District. It is involved in the production of more than 12 brands (Club beer, Eagle beer, Castle Milk Stout, Chibuku, Shandy, Voltic mineral water, Stone beer, Beta malt, etc.). Less than 10 percent of its income is generated from its cassava-based Eagle beer. All other incomes are generated through other brands. It has a plant that is privately owned and can be redeployed for the production of other beverages at minimal cost. This minimal cost results from the changing of the parts of the machine if a different beverage is to be produced and also depreciation that comes as the machine is continuously used.

ABL deals with Premium Food Company Limited (PFCL) for the supply of maize grits and millet for production of its (ABL) beverages. Apart from PFCL, ABL is also in partnership with Caltech, which supplies High Quality Cassava Flour (HQCF) for production of beer. ABL is also initiating a partnership agreement with Yedent Agro Limited for the supply of raw materials required for beer production. Unlike DADTCO-Ghana, which was recommended to ABL by SAB Miller, Caltech, Yedent Agro Limited and Premium Food Company Limited approached ABL to partner them in the supply of the raw material.

The company has over 50 trucks, more than 50 vehicles, and 2 packaging lines, and 5 boilers which can all be used in other operations or production lines at virtually no cost. It employs about 400 workers in all categories (managers, contractors, production and laboratory technicians, drivers etc.) - 240 are males and 160 are females. The youth (18 to 25 years), both male and female, is about 10 percent of the total employees.

DADTCO is a multinational company with its headquarters in Holland and with branches in Ghana and some other African countries (Nigeria, Zambia, Mozambique and Cameroon). The Ghana branch is located in Afadzato South District (Golokwati) in the Volta Region. The DADTCO-Ghana branch was established in 2010 to find a solution to the high post-harvest losses of cassava production in Ghana after results from a project of MiDA (Millennium Development Authority) in the Afram Plains of Ghana confirmed the challenge of high post-harvest losses in cassava. DADTCO-Ghana was then selected to produce High Quality Cassava Cake (HQCC) for Accra Brewery Limited (ABL) through the recommendation from a former employee of SAB Miller (the parent company of ABL) in 2012. The initiative was to create a social enterprise that would help stem the annual glut associated with cassava and the loss of income to farmers; and to supply HQCC to ABL for the production of one of its beer brands (Eagle beer). The selection of DADTCO-Ghana production site was based on three criteria:

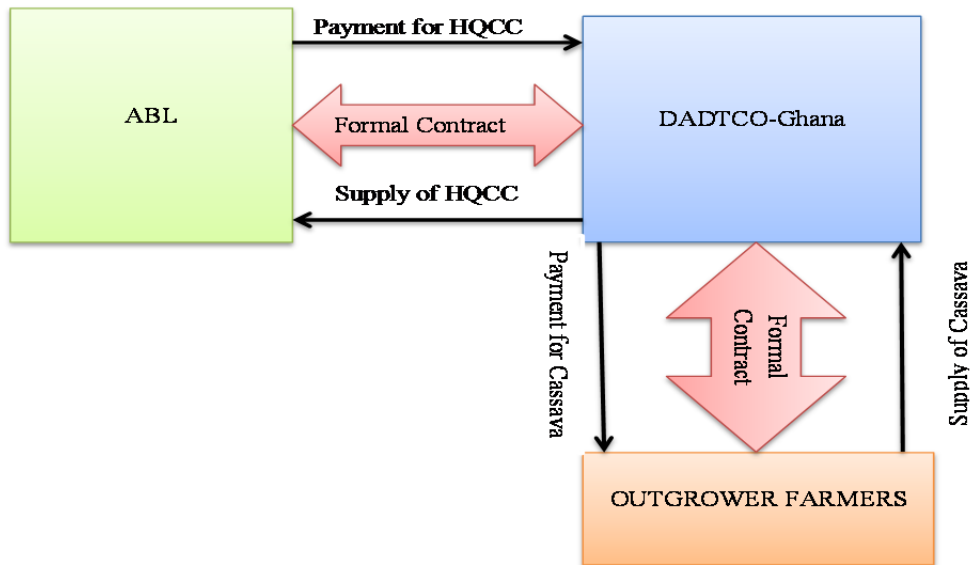
- Nearness to a roadside for ease of transportation of cassava roots and HQCC
- Presence of clean water for the processing of the HQCC
- The slope of the land enabling ease of disposal of the waste.

Currently, DADTCO-Ghana no longer produces HQCC because ABL terminated the contract owing to unacceptably high levels of fiber in the HQCC. The additional costs associated with removing the fiber before production of the Eagle beer was significant, and it therefore did not make economic sense to continue with the partnership. ABL opted for the use of High Quality Cassava Flour (HQCF) instead of HQCC. At full operation (capacity), DADTCO-Ghana could process forty metric tons (40 mt) of cassava roots per day and employ (directly and indirectly) about 36 people as well as its 12 permanent and 16 casual workers. The permanent workers comprised 10 males and 2 females, while the casual labourers comprised 13 males and 3 females. Ten of the employees were youth (age from 18 to 25). Those who were employed indirectly include canteen and food service providers.



**Figure 2: Schematic diagram of the relationship between ABL, DADTCO-Ghana and Farmers**

**ABL-DADTCO-GHANA-FARMERS RELATIONSHIP**



**4.3 Accra Brewery Limited (ABL), CALTECH, and Smallholder farmers**

It is important to note that Caltech currently has no contractual agreement with any buyer but is in the process of negotiations to engage in a formal contractual agreement with ABL so they can supply HQCF to ABL. Therefore they sell on the spot market. The motivation to partner with ABL is driven by the need to solve unemployment problems among the citizenry, increase return from farm production to farmers, reduce the amount of foreign exchange that is used to import raw materials, and the need to support the local economy by buying local raw materials. The objective of ensuring profitability with regards to their operations is not lost, as they have easier and cheaper access to raw material (cassava roots) for their operations. Any individual or company that wants their product approaches Caltech to buy and pay immediately or agrees to schedule payment if the product (HQCF) is bought on credit. Any credit given is on a “gentleman’s agreement” based on the belief that the buyer will pay at the agreed time. The HQCF is sold mainly to secondary schools, private individuals, and companies from the plywood and biscuit industries and to ABL.

Caltech emerged from a sister company called Banket Limited. Banket was involved in the importation of Extra Neutral Alcohol (ENA), a food grade alcohol imported from India, South Africa, and Brazil. The imported alcohol was then sold to beverage-producing firms such as Kasapreko Ltd and Baron Distilleries Ltd. Depreciation of the local currency which led to high

foreign exchange losses and an attendant upsurge in the price and irregularities in the supply of imported alcohol prompted the Board of Directors of Banket to move into local alcohol production for their clients in 2006. Caltech was therefore established in the same year as a company to produce High Quality Cassava Flour (HQCF) to meet market demand. To this end, Caltech acquired 3000 ha of land<sup>1</sup> in the Volta region under a 70 year leasing agreement with the traditional leaders for the production of cassava for processing. The company started varietal trials to ascertain the varieties best suited to the agro-climatic conditions in the area. Production of HQCF eventually started in 2012. Therefore between 2006 and 2012, the company imported ethanol for the pharmaceutical and allied industries and also cultivated soya beans which were used for biofuel production (which was later stopped because of lack of funds). Caltech sold the soya beans to a processor who extracted the oil and sold it back to Caltech. The oil was then processed into biofuel for powering of their tractors and other implements. Currently, the Company is in the process of diversification by venturing into ethanol production; and installation of machinery is almost completed.

The policy to diversify was triggered by the desire to expand their investment in the economy by mopping up cassava which hitherto suffered high post-harvest losses due to the market's inability to absorb the supply of roots annually<sup>2</sup>. Again, plans are far advanced for the company (Caltech) to start ethanol production since cassava is readily available for this purpose. The entire business and income of Caltech is dependent on cassava. Caltech has some 70 permanent staff and 70 casual workers. Fifty-six of the permanent workers are females and about 35 of the 70 are youth. Caltech is currently working with a total of 150 farmers, 70 percent of whom are women.

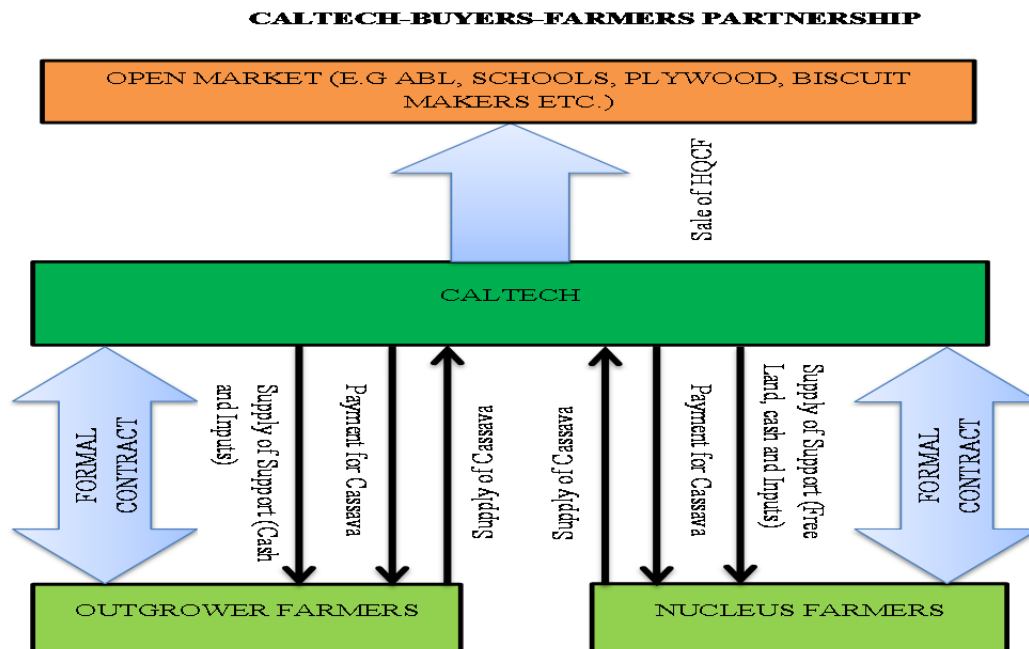
Caltech initiated a nucleus farm model as a way of involving displaced farmers in their primary cassava production (after land acquisition) so that they could help minimize the shocks (mainly economic) farmer households endured. However, Caltech's production forecast indicated that they could not immediately meet the quantities needed for production of HQCF. Therefore, the company solicited the assistance of out-growers to help in the production of cassava. This initiative had objectives of contributing to the economy in the vicinity of the company while ensuring constant and regular supply of cassava roots. Caltech has contractual agreements with individual farmers in the association (Caltech Cassava Out-growers Association-CCOA) and this has existed for three (3) years.

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<sup>1</sup> The acquisition of this land displaced farmers who previously cultivated the land to other farming locations

<sup>2</sup> Cassava is readily available – Caltech's assessment assures the reliability and sustainability in the supply of cassava

**Figure 3: Schematic diagram of Buyers (ABL, others), Caltech, and Smallholder Farmers**



#### 4.4 Description of Farmers and Farmer Organizations involved in the Partnerships

The farmers covered by the study were generally people with years of experience in cassava farming, and who also sold their roots on the open market. With ages ranging between 39 and 65 years (Table 3) most of the farmers have been farming cassava (in addition to other food crops) all their adult lives and therefore have developed traditional knowledge and experience in both production and marketing cassava and cassava products. Our interactions with them revealed that their major frustration in the cassava business centred around price instability on the cassava market. Cassava prices on the open market are usually low during the glut period in the rainy season and high during the lean season when everything gets dry. The farmers have therefore embraced the production and marketing under contracts (both verbal and written) where prices are stable.

The farmers, who are all married with families, range from those with no formal education (14% to 18%) to the educated ones (64% in Bawdjiase area and 86% in Ho area), respectively. The farmers are also categorized into nucleus farmers (those who work on block farms or lands owned by the contracting entity) and outgrower farmers (those who farm on their own lands under contract); even though purchases of cassava may sometimes be made from other non-contract farmers. Also, there are more female cassava farmers at Bawdjiase (28%) than in the Ho area (10%); but a good number of migrant farmers are present in both places, 35% at Bawdjiase and 30% in the Ho area (see Table 3). It should be noted that the gender representation in each area reflects more the structure of the farmer populations in the study

areas rather than any gender selection bias. No existing farmer organizations for cassava were also identified in the study areas. However, farmers who joined the partnerships constituted themselves into groups to enhance their bargaining power.

**Table 3: Summary Statistics – Socio-demographic characteristics of Farmers**

		BAWDJIASE – ASCo <i>No of farmers = 11</i>			HO-CALTECH <i>No of Farmers = 10</i>		
Sex	Male	72%			90%		
	Female	28%			10%		
Age		Min	Mean	Max	Min	Mean	Max
		40	55	65	39	52	65
Household size		3	6	12	2	7	15
Marital status	Married	100%			100%		
	Unmarried	-			-		
Educational status	No Education	18%			14%		
	Non-formal	9%					
	Primary	9%					
	Middle/J.H.S	36%			57%		
	Secondary/S.H.S	18%			14%		
	Tertiary/Training College	10%			15%		
Residential status	Indigene	55%			70%		
	Migrant	45%			30%		
Frequency of Residency	Only farming season	-			30%		
Principal Occupation	Throughout year	100%			70%		
	Farming	100%			80%		
	Salaried Employee	-			20%		
Quantity of harvested fresh cassava roots sold in 2014 (Metric ton)		Min	Mean	Max	Min	Mean	Max
		6	45.48	134	10	170.7	500
Total revenue from fresh cassava sales in 2014 (GH¢)		1,080	6,314.40	24,120	1,000	17,072	50,000

*Source: survey data, 2015*

#### 4.5 Key Investments

GGBL has its own multi-complex processing plant used for the production of 14 brands of alcoholic and non-alcoholic beverages, while ASCo has a plant for processing of HQCF to GGBL. As part of the partnership arrangement, GGBL has provided technical and managerial support in the form of human resource, pre-financing payments for breakdown parts, etc. to ASCo. The provision of this support has helped in the smooth running of the company to ensure constant production of starch since the government of Ghana's subventions to the company have not been regular. The aggregator (MAXPO TS) has also invested in trucks

which are used in hauling cassava roots from assembly points to ASCo premises for processing.

The partnership between Guinness Ghana Brewery Limited (GGBL) and Ayensu Starch Company (ASCo) was initiated in 2012 and this resulted from the introduction of Ruut Beer on the Ghanaian market by GGBL. The intention was to fully source local raw material – High Quality Cassava Starch (HQCS). After an assessment of ASCo, GGBL initiated the partnership because ASCo was deemed capable of a reliable supply of HQCS. The partnership was motivated by the need to create opportunities for employment, increase returns from farm production to farmers, cut down on foreign exchange requirements meant for importation of raw material (especially HQCS), which helps in slowing the rate of depreciation of the domestic currency, and provide a stable price from a ready market for farmer produce. Ultimately, the partnership has created a ripple effect of increases in production capacity for ASCo and farmers.

To address the challenge of frequent breakdown of ASCo's plant and ASCo's inability to fund such expenditure, GGBL provides funding for the purchase of spare parts (GGBL imports on behalf of ASCo) to ensure that the production process is not unduly interrupted. GGBL also supports ASCo with working capital which is refunded. However, salaries of ASCo staff are paid for by the Government of Ghana. Also GGBL provides ASCo with human resource assistance (a technician and relationship/supply performance manager stationed at ASCo). The technician helps in the repair and maintenance of the processing plant while the supply performance manager ensures that production targets are met and products are delivered on time. GGBL also provides technical training to ASCo staff to ensure that their product (HQCS) meets internationally accepted food safety standards. GGBL bears the cost of transportation for carting HQCS from ASCo to its plant in Accra. Apart from twelve block farmers that are provided with land, ASCo only provides technical support on agronomic practices to all farmers in its catchment area. Prior to this, ASCo provided inputs on credit to the block farmers. MAXPO TS also provides financial support to ASCo intermittently to ensure continuous operation of the processing plant, as well as to farmers during emergencies. Additionally, MAXPO TS advances credit support to farmers in the form of soft loans to fund farm activities. The credit is paid back when the farmer supplies cassava roots to MAXPO TS (i.e. the value of the credit is deducted from the total value of the produce delivered).

In the case of Accra Brewery Ltd (ABL) and (Dutch Agricultural Development and Trading Company (DADTCO)-Ghana partnership, the latter invested in a processing plant (Autonomous Mobile Processing Unit-AMPU) in May 2013 solely for the purpose of processing cassava into HQCC for ABL. Until the termination of the contract/partnership, ABL bought all the HQCC produced by DADTCO-Ghana. ABL made some initial capital investment in DADTCO-Ghana by providing financial resources to the company (DADTCO-Ghana) for the purchase of some equipment. The repayment of this amount invested by ABL was spread over some number of years at no interest. In the two and half years of existence of the partnership, ABL provided financial support to DADTCO-Ghana on request. ABL provided no technical and managerial support in the form of human resource to DADTCO-Ghana. The major investment DADTCO-Ghana made in the partnership with smallholder

farmers was provision of assistance during harvesting and transportation services at subsidized fees to farmers.

Caltech has a processing plant that is specialized in processing cassava roots into flour for sale on the open market, which has attracted ABL to initiate a process to work in partnership with Caltech. The plant is owned and operated privately by Caltech Limited. The operations of Caltech began in 2012 when it acquired 2,500 hectares of land at Hodzo in the Ho municipality of Ghana. The company has invested heavily in equipment for the production and harvesting of cassava. Specifically, the company has three farm buildings, eight tractors, five trailers, two cassava peelers, six up-rooters, three cassava dough processors, four trucks, two bin dryers, two graters, two riggers, three harrows, four bulldozers, five cassava plates and four personal vehicles. With the exception of the graters, cassava dough processors and cassava peelers, which are used for cassava only, all the other equipment are re-deployable at nearly no cost. The graters are used to process cassava into cassava dough, and the bin dryers are used for drying the cassava cake.

The relationship of Caltech with farmers is a very generous one. Caltech has invested in land, which it provides free to the farmers working on its block farms. It also supports the farmers with all the necessary inputs such as planting materials, interest-free loans during off-season, technical training on approved agronomic practices, etc. The cost of transporting the cassava roots from the farm gate to Caltech processing site is borne by Caltech. Caltech supports more than 75 percent of the cost of production per farmer, especially those working on its block farms. About 35 percent of cassava that the company processes comes from the out-growers, implying that the block farmers produce 65% of the total volume of roots processed by the Caltech.

Thus, further investments in the existing plants of GGBL and ASCo have been beneficial and improved the operations of both entities. DADTCO-Ghana invested in a new processing plant because of the partnership with ABL. On the other hand, Caltech made investments in cassava processing to serve the open market, but that has attracted ABL to initiate a process to form a partnership with Caltech.

#### **4.6 Structure of the Partnerships**

##### ***GGBL-ASCo-MAXPO TS-Farmers***

There is a written formal contractual agreement between GGBL and ASCo that is binding on both parties. The duration of the contract is for a year, and it is renewed after expiration. The contract basically stipulates that:

- ASCo will buy cassava from smallholder farmers and process it into HQCS for GGBL at an agreed price;
- ASCo will be paid by GGBL for the starch and also provided with any capital that may be needed for recurrent expenditure.
- GGBL would be supplied with 99 percent of the HQCS produced by ASCo.
- Transportation cost (of carting HQCS) from ASCo to GGBL production site will be borne by GGBL

- GGBL will pre-finance some of the operational cost of ASCo. For example, payments for the broken-down parts of the processing plant, electricity bills, etc. would be made on behalf of ASCo.
- GGBL upon delivery of the HQCS will deduct all expenditures incurred on behalf of ASCo and give out the balance if any. There will be prompt payment of any balance due ASCo.
- The contract can be renegotiated depending on unforeseen contingencies. For example, the price that had already been agreed on for the starch per metric ton can be renegotiated when the price of cassava increases astronomically on the markets and cost of production changes significantly. Proposals for adjustment of agreed price are always initiated by ASCo.

There is a written formal contractual agreement between MAXPO TS and ASCo. The contract has duration of six months and is renewable based on performance. The terms of the contract are that:

- MAXPO TS will purchase cassava roots from smallholder farmers and supply them to ASCo.
- ASCo will receive the roots and perform quality checks.
- MAXPO TS will pre-finance payment to farmers where necessary.
- MAXPO TS will coordinate the activities with farmers (taking of records of cassava supplied, inputs and support if any, preparation of payment vouchers, etc.).
- ASCo will pay MAXPO TS for its services (transportation and any other costs) through GGBL. It should be noted that the contract is with ASCo and not GGBL although GGBL makes the payment directly to MAXPO TS on behalf of ASCo.
- Payment to MAXPO TS is made by GGBL after submission of invoices approved by ASCo.

ASCo always respects the contractual agreements because of the good relationship it has with GGBL. GGBL buys the starch whenever it is available (from ASCo). The key reason for ASCo's inability to meet GGBL's demand is the frequent breakdown of the starch processing plant. The contract specifies no disclosure of contractual agreements to a third party – to protect the parties in the partnership. Although there are some challenges, ASCo described the relationship with GGBL as good and cordial because GGBL largely respects the terms of the contract. It is important to note that changes to the contract must be strongly justified with evidence of the need to effect such changes. MAXPO TS indicated that ASCo has never breached the contract since it is satisfied with the quality and quantity of cassava roots that it supplies. The contract may be renegotiated periodically; for example, the price paid per metric ton of cassava roots may increase due to a significant increase in cost of production for the farmers.

MAXPO TS has a formal relationship with farmers concerning the supply of cassava roots. This documentation provides information on the date and quantity of cassava roots supplied by each farmer and the cash amount due the farmer. Farmers who receive support for on-farm or off-farm activities are barred from side selling cassava. There is a very good relationship between MAXPO TS and the farmers. In this respect, farmers do not breach the contractual terms (which mainly requires that farmers deliver cassava with high starch content); therefore,

there is certainty of delivery on the part of farmers. MAXPO TS does not select the farmers but deals with any farmer who is willing to sell. However, farmers on the block farm are selected by ASCo. The main criterion for selection is the nearness of the prospective farmer to ASCo's land. ASCo does not provide support (inputs or financial support) to the block farmers apart the land they provide to the latter. The production from the nucleus farm contributes about 25% of the total volume of roots processed by ASCo.

#### *ABL - DADTCO and Farmers*

There was a formal contractual<sup>3</sup> agreement between DADTCO-Ghana and ABL. The duration of the contract was for seven years and could be renewed after expiration. During the period of the contract, it could be renegotiated depending on issues such as costs of production that may emerge. For example, the price that had already been agreed on the HQCC per metric ton could be renegotiated. This usually transpired when the price of cassava and the cost of production increased significantly more than anticipated. The contract also required DADTCO-Ghana to sell HQCC exclusively to ABL, while ABL was enjoined to buy any quantity of order it had placed. The contract also required that DADTCO-Ghana buy all of its cassava roots from smallholder farmers. This was a condition precedent to affirmation of the contract (as an assurance of ready market for smallholder farmers). The contract was terminated for the following reasons: (a) too much fiber content in HQCC- leading to increased cost of production of eagle beer, and (b) difficulties in storage due to high moisture content in the HQCC leading to a high incidence of spoilage. Although DADTCO-Ghana is not currently operating, it has plans of procuring additional equipment with capability to produce HQCC to the standards required by ABL (especially as regards the levels of fiber in the HQCC).

The partnership between DADTCO-Ghana and farmers was formal with a written contract. They also had a database with a unique identity code for each farmer. DADTCO-Ghana relied on the acreage each farmer was willing to cultivate at the beginning of each season to forecast quantities of root they expected for processing during the season. The database allowed the company to monitor each farmer during the season. To ensure reliable and secured supply of roots for sustained operations, DADTCO-Ghana provided guarantee forms to all partner farmers. The guarantee form represented an off-taker agreement between the parties.

#### *ABL - Caltech-Ghana and Farmers*

As already noted, there is currently no existing contract between ABL and Caltech-Ghana, but the two parties are in a process of negotiating a partnership. Meanwhile, ABL purchases cassava starch from Caltech on the open market just like any other buyer. However, there is a written formal contractual agreement between Caltech and farmers which is binding on both parties. Caltech operates two farming models which are: (1) Block farmers (these are farmers who cultivate their cassava on Caltech owned land) and (2) Out-grower farmers (these are farmers who cultivate the cassava on their own land). Caltech makes advertisement through the local media, interested farmers approach the company and request to be part of the scheme, and Caltech selects farmers to cultivate its land for cassava (block farmers). The selection of block

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<sup>3</sup> DADTCO-Ghana was not in the position to provide a copy of the contract document due to non-disclosure clauses in the contract.



farmers is based on the following considerations: (a) nearness of the farmer household (i.e. farmers who are in the catchment areas of the company) for ease of interaction and monitoring of farmer activity (farmers' houses are not built on Caltech's land but block farmers only cultivate the fields) , and (b) history (background) of the farmer – honesty, and whether the farmer is hardworking (based on inquiries Caltech conducts into the background of would-be block farmers by asking from neighbours) .

The terms of the contract with farmers (both block and out-grower farmers) are as follows:

- Caltech provides funds for land preparations, based on the acreage that the farmer cultivates.
- Caltech provides input credit including planting materials for farming (this excludes labour).
- Caltech provides technical training on best agronomic practices such as weed and disease control, among others.
- Caltech respects off-taker agreement (Caltech must buy all the cassava supplied by farmers)
- Farmer sells harvested roots to Caltech. Block farmers strictly sell all to Caltech but out-growers sell in-kind to cover the value of pre-planting assistance received from Caltech. The rest of their produce can be sold to Caltech or elsewhere.
- For out-grower farmers, price renegotiations are only possible if the going market price is substantially different from agreed price at time of delivery.
- The duration of the contract is one year and could be renewed after expiration.

#### **4.7 Key Requirements of the Contracts**

##### ***Quantity and Quality Requirements of the Contract***

Quantity requirements between GGBL and ASCo are mainly a yearly forecast. Under the current arrangement, ASCo is unable to meet the quantity requirements of GGBL, and this is mainly as a result of frequent breakdown of the processing plant. Indeed ASCo supplies less than 10 percent of the quantity needed by GGBL. ASCo currently produces less than 6 mt/day of HQCS, which is much lower than its processing capacity of 22,000 mt/annum (the equivalent of 88 mt/day assuming that the plant operated 250 days per year). The partnership between MAXPO TS and out-grower farmers does not stipulate quantities of roots to be supplied to MAXPO TS. Farmers may receive support from MAXPO TS but this is not obligatory. It is done just to ensure smooth and continuous supply of the cassava roots. If a farmer receives monetary support for off-farm purposes or inputs for farm activities, he/she is required to pay back in-kind based on the value of the support extended.

In terms of quality, GGBL expects HQCS from ASCo with the following characteristics:

- It must be very white
- It should be free from cyanide
- Must have ideal moisture content (9-11percent)

To ensure that these quality requirements are met, GGBL requires ASCo to attach a Certificate of Analysis (CA) to the starch before it is delivered to GGBL. On receiving the starch with the CA from ASCo, GGBL laboratory also conducts its own analysis to confirm adherence to the quality requirements expected.

Though ASCo does not support farmers in the production process, it requires the cassava roots to satisfy certain quality standards. This is to ensure that the quality requirements of its major buyer (GGBL) are met. These standards are as follows:

- The cassava must have high starch content
- It must not be too fibrous
- It must not be rotten
- It must get to the processing site within 24 hours after harvest.

These quality standards are monitored by ASCo agents (technical officers) who ensure compliance. This is done by physical inspection since the technical officers know which cassava varieties have high starch content.

Between ABL and DADTCO-Ghana, the latter was able to meet all the quantity requirements demanded by ABL on weekly or monthly basis. On the other hand, farmers were not obliged to sell to DADTCO-Ghana since it (DADTCO) did not provide financial assistance or input credit to farmers. However, it was obligatory for DADTCO-Ghana to buy the produce from the farmer. Quantity requirements from farmer end was not specific (i.e. quantity expectations from farmers were only promissory and not enforceable).

In terms of quality, ABL expected HQCC supplied by DADTCO-Ghana to meet the following standards:

- The water used in the production process is approved or certified by Water Research Institute (WRI) of Ghana.
- The moisture content of the HQCC should be 54 percent or below.
- Cassava roots must be harvested and processed within 24 hours.
- Enzymes are added to break down the fiber in the cake.
- Must not be too yellowish
- Must be free from cyanide
- Must be well packaged

In order to confirm that these quality requirements were met by DADTCO-Ghana, ABL made field visits to DADTCO production site intermittently. Analytical laboratory testing was also conducted by ABL to confirm the quality of HQCC supplied. DADTCO-Ghana required that cassava roots harvested from farmers were not older than 14 months old since the fiber content of older cassava is too high and unacceptable.

The relationship between ABL (and other buyers) and Caltech currently is only a loose one. For example, in the case of a large buyer (ABL – usually 50 tons per month), prior notice is given to allow Caltech meet such demand. The standard quantity is supplied in units of 50 kg bags. On the other hand, Caltech supplies immediately on demand especially for buyers of small quantities. Also, quantity requirements are not strictly spelt out in the contract between

Caltech and farmers but Caltech buys all quantities supplied by farmers. Caltech does not specify the quantity of cassava to be delivered by farmers but there are quality standards that must be met before Caltech purchases the roots. These quality standards include the following:

- The roots should not be over aged (i.e. must not be more than 12 months old).
- They must not be rotten or about to deteriorate.
- They must not be too fibrous.
- They must be free of cyanide.
- They must have high starch content

In order to ensure that these quality requirements are met, Caltech deploys its Agricultural Extension Officers to pay field visits to the farms to ensure that farmers adhere to best agronomic practices. Caltech also takes a sample of the cassava roots and breaks them into pieces for physical examination to ensure that the quality standards are met. Again, Caltech conducts physical examination and laboratory testing of the cassava to be sure the standards are met.

Caltech also works in collaboration with Food Research Institute (FRI) of Ghana to test and certify HQCF before it is sold to end users.

#### ***Timing, Delivery and Inspection Procedures***

Before the HQCS is transported to GGBL, ASCo ensures the product conforms to specified standards and is well packaged (in units of one metric ton white high density polythene bags). There are no delays in delivery - GGBL has outsourced transportation of HQCS to DHL, and DHL delivers promptly to GGBL. ASCo requires harvested cassava to reach the processing plant within 24 hours. The cassava is rejected if farmer fails to comply with this requirement. The cassava begins to ferment after 24 hours of harvest and as such the starch content will begin to decline rapidly. Technical officers from ASCo monitor the harvesting schedule of farmers to ensure roots are delivered within 24 hours to the processing plant.

DADTCO-Ghana supplied HQCC to ABL on demand. However, to ensure proper monitoring of farmers in the partnership, DADTCO-Ghana employed GPS devices and mobilized local farmer leaders to trace farmers and monitor their farming activities. This helped in planning for harvesting. DADTCO assisted farmers in harvesting by organizing up-rooters (local people who are paid) to harvest and also provides transportation from farm to processing plant along with the farmer, where the crop was weighed and recorded for later payment (after transportation cost had been deducted).

In the case of Caltech, the Agricultural Extension Officers go to inspect the farm and the cassava before the cassava is harvested. Most harvesting is done in the rainy season when the ground is wet enough to allow for ease of harvesting. Caltech has a database of all its farmers, so harvesting is staggered to avoid congestion and rot of the cassava at the processing site.

#### ***Contingencies, Monitoring and Mechanisms to Resolve Disputes***

In order to ensure effective monitoring and supervision so that contractual agreements are respected, GGBL has stationed two of its staff at ASCo to assist with technical and managerial activities. Since the partnership was initiated, no party has breached any part of the contract. There are daily emails and monthly and quarterly review meetings, mostly through mobile

phone conference calls, where challenges are reported and solutions proposed. Where the need arises, there are physical meetings to address challenges. Though disputes rarely occur, when they do, they are settled through negotiations and dialogue. Parties have the option to use legal means, but this approach has never been applied. On humanitarian grounds, ASCo supports farmers (both block farmers and out-grower farmers in their catchment area) with funeral donations whenever any of the members of the farmer groups loses a relative. This is not obligatory and it is not paid back, but done to make the farmers have a sense of belonging so that they will continue to produce for the factory. Apart from the 12 block farmers, there is no strict monitoring of farms, and disputes which rarely arise are settled through negotiations.

ABL and DADTCO specified the following agreement in the contract for monitoring and supervision so that contractual agreements were respected:

- Field visitation to the production premises of each party to ensure that equipment used for analysis are well sterilized and calibrated.
- Visitation of laboratory team to conduct quality assurance analysis (QAA).
- Further analysis of HQCC delivered in terms of the moisture content, fat, protein, presence of aflatoxins, etc.

Although ABL indicated that there was no significant dispute before the termination of the contract, it was specified in the contract that any dispute that arose could be settled through negotiations.

In the case of Caltech-Ghana, it encourages the Agricultural Extension Agents (AEAs), who occasionally visit the farms to make sure farmers adhere strictly to best agronomic practices. This is done to ensure effective monitoring and supervision so that contractual agreements are respected. The AEAs also provide technical assistance to any farmer facing challenges in the production process. They then bring feedback from the farmers to management of Caltech for any required improvements or otherwise. Farmers also have the opportunity to approach the company to report any challenges that they may be facing for possible remedy. Disputes, which seldom arise, are resolved through negotiations.

#### **4.8 Pricing Strategy and Payment Modalities**

The pricing of the starch is done through negotiations between GGBL and ASCo. The two key considerations for pricing are: (a) the cost of production of starch, and (b) prevailing local and international prices of starch per metric ton. After the price is set, any future adjustment is normally at the request of ASCo. Payment to ASCo is made 30 days after delivery of HQCS and submission of invoices to GGBL. Payment is made in full and not in instalments, but before payment is made, all forms of support that have been given by GGBL are valued and subtracted and the remaining balance is paid to ASCo through bank transfer.

Negotiation on pricing of mature roots is done pre-planting in each season between officials of ASCo and farmer representatives. Consideration is given to the current crop budget and margins for farmers to arrive at the final price. There may be an upward review of the price if there is a significant rise in the going market price of cassava but this is contingent on an upward review of the price of HQCS by GGBL. Payments to farmers may be made in full or by instalments through bank transfer, which is done within two weeks after delivery. The value

of support extended to each farmer is deducted before final payment is made. MAXPO TS pays the agreed price to farmers and reclaims this and service charge after submission of invoices to GGBL (after MAXPO TS submits payment vouchers for quantities of roots bought, they are also paid a commission of GH¢ 30/ton of roots transported). MAXPO TS can only renegotiate the service charge paid by ASCo through GGBL should the need arise.

The considerations made for pricing the HQCC between ABL and DADTCO were similar to what happens between GGBL and ASCo, based on the same two things. However, price changes could only be effected in the case of ABL and DADTCO if there were significant changes in the above considerations – the cost of production and changes in the local and international prices of starch. Payment to DADTCO-Ghana was made in US dollar terms and took two weeks after delivery of the products. This is because SAB Miller’s accounting system required that payments be made from the headquarters of the company in South Africa. As a result, release of funds required several stages of administrative processes, which led to delays in payment, and it took about two weeks before payments (less any pre-financed amounts) were made to DADTCO-Ghana.

Pricing arrangements between DADTCO and farmers were the most sensitive area of the partnership. The price to be paid per metric ton of cassava was negotiated with the relevant stakeholders (DADTCO-Ghana on one side and farmers together with representatives of the Ministry of Food and Agriculture, DCEs, Chiefs, etc. on the other side). The price was agreed on pre-planting each season but it could be renegotiated if the price for the cassava on the open market was higher and the cost of production increased significantly. In this respect, any changes in price were effected in the next planting season. Cash payments to farmers for the cassava delivered were made in full immediately after delivery. On the other hand, cheques were given to relatively large-scale farmers (with larger output levels) to enable them access their payments at the bank.

In the case of Caltech, consideration is given to the following before the price of HQCF is set: (a) the cost of production, (b) the existing spot market price of HQCF and its substitutes (such as wheat flour), and (c) the company’s margin. Payments to Caltech are made through cash (for small buyers) or bank transfers (for large buyers – ABL, biscuit and Plywood manufacturers). The payments made in full immediately after delivery of goods.

The pricing of a metric ton of cassava between Caltech and farmers is done through negotiations with farmers. A meeting among all stakeholders (Caltech, Farmers, Chiefs, Member of Parliament, District Chief Executive, Ministry of Food and Agriculture, etc.) is held to determine the price of the cassava based on the following considerations: (a) current crop budget (based on consultations between officials of Caltech and farmers), and (b) the open market price for cassava roots. Full payments (less the value of credit advanced to farmers) are made in cash immediately after delivery of roots to Caltech.

#### **4.9 Risks in the Partnerships**

The major risk associated with the GGBL-ASCo partnership is supply-side risk. This is the result of uncertainties associated with the frequent breakdown of ASCo’s processing plant. As

a result, GGBL is unable to meet production targets or adequately plan the quantum of beer that is to be produced for the market considering that demand for “Ruut beer” is very high. Largely, a breakdown of the processing plants distorts the production, marketing and entire business plan of the “Ruut beer” for GGBL. Risks in the partnership between ASCo and MAXPO TS are not shared. For instance, if MAXPO TS supplies roots to ASCo and the processing plant breaks down, the loss is entirely borne by ASCo. On the other hand, MAXPO TS bears all the loss of the cassava roots in the event of an accident when transporting cassava to the factory. ASCo shares no risk with the farmers. Any risk associated with production and harvesting of the crop is entirely borne by the farmer.

DADTCO faced no risk during the period of the partnership until the termination of the contract leading to shut down of the processing plant (in 2014) and its attendant challenges – labour layoffs, and loss of income. ABL and farmers as well faced no risk at all in the period of the partnership. However, at the time the contract between ABL and DADTCO was terminated, farmers who had already committed their lands to cassava production for processing by DADTCO lost their market and had to face the uncertainties of open market sale of cassava.

Caltech bears all the risk that is associated with the sale of HQCF, especially with respect to default in payment after HQCF is delivered to clients on credit. The only risk associated with the partnership with farmers is the risk faced in agriculture in general (as regards exposure to natural disasters like floods, drought, and fire outbreaks). However, if any of these incidents occurred, the contract is renegotiated in such a way that the farmer is given a second chance to repay the input support (cost) in the next planting season in-kind. If the farmer is not able to pay back in the next planting season, the contract between the parties is cancelled. .

#### **4.10 Other Important Transactions and Relationships that Support the Partnerships**

It is noteworthy that each of the partnerships studied has some inbuilt mechanisms (sometimes informal) that help to sustain the relationships. For example, even though it is not part of the contractual agreement, GGBL facilitated the introduction of an aggregator (MAXPO TS). The aggregator has financial resources to assemble cassava roots to the processing plant (ASCo). The aggregators are required to pay the farmers immediately on delivery of cassava, and in turn, the aggregator is reimbursed for the cost of cassava purchased from farmers and also paid for the transportation service it renders. GGBL has outsourced the transportation of the starch from ASCo (which is located some 100 km from GGBL) to DHL. This means that upon finishing the production of the starch, ASCo does not have to bear any additional cost of transporting the starch to GGBL. ASCo also provides letters of recommendations to farmers who have good standings to access loans from commercial banks.

DADTCO-Ghana provided gifts (solar lamps, key holders, lunch to farmers from long distances, etc.) as incentive to farmers to remain committed to the partnership. DADTCO-Ghana also paid for the cost of harvesting and transportation of cassava roots to their processing plant.

As a way of building farmer loyalty, Caltech provides off-season soft loans to farmers in need to meet both economic and social needs (e.g. payment of school fees or funeral expenses). It also makes funeral donations to bereaved farmers. Caltech also constructs and rehabilitates feeder roads to provide easy access routes to farmers' plots.

#### **4.11 Performance of Partnerships**

##### ***Successes of the Partnerships***

The survey suggests there have been positive effects in terms of business sales/revenue, value chain coordination, communication among value chain actors, and governance. For example, it was revealed during the study that there have been yearly increases in the profits of GGBL but it could not tell conclusively whether it is the result of the introduction of the "Ruut beer". The other partnerships such as ABL and DADTCO also experienced similar increases. Overall, benefits accrued to stakeholders in all the partnerships including:

- The partnership has helped revive ASCo (operating consistently for the past three years) which hitherto suffered closure for months due to inability to raise funding for maintenance purposes.
- Productivity and returns on investment in labour (for ASCo staff) have improved significantly since there is little idle time compared to period before the partnership.
- The global agenda of Guinness International is to use more local raw materials in the production of its products. This partnership has led to the realization of this objective and has contributed to developing the local economy.
- GGBL's corporate social responsibilities to the local economy and the catchment areas of ASCo have improved tremendously.
- ASCo is very open and honest in its transactions with GGBL. They do not side sell the starch that is supposed to be sold to GGBL to any other competitor or company.
- The partnership has provided farmers with a ready market and reliable source of income, which has also helped to increase productivity, particularly for farmers.
- The partnership has also helped to create more job opportunities to farmers who otherwise would have remained unemployed.
- The number of acreages put under cultivation by smallholder farmers has also increased (most farmers who hitherto were cultivating less than one acre (0.4 ha) but have increased to more than 3.75 acres (1.5 ha).
- The presence of an aggregator has eliminated transportation challenges farmers faced with hauling harvested roots to ASCo prior to the partnership
- Improvements in ABL's corporate social responsibilities to the local economy and the catchments areas of DATDTCO-Ghana.
- Farmers are now relatively more food secure than before the partnership as they can now harvest more per hectare as a result of adoption of improved methods of production (through farmers' access to free technical training on best agronomic practices).
- Stable prices for farmer produce are created with the partnerships.
- There are job opportunities for those who have been employed by the company who would otherwise be unemployed.

- The quality and quantity of HQCC supplied by DADTCO-Ghana improved as a result of the partnership with ABL (by procurement of relevant parts that helped ensure high quality standards).

### ***Challenges of the Partnerships***

Several challenges faced the partnerships, and these need to be addressed to ensure the sustainability of the partnerships. Key challenges, particularly between GGBL and ASCo, are summarized below:

- Supply constraint: the inability of ASCo to supply the quantity of starch needed by GGBL due to frequent breakdown of parts of the processing plant, leading to inconsistencies and uncertainties in supply. This has led to GGBL producing less than 10 percent of the market demand for the “Ruut beer”.
- Managerial challenges despite training provided by GGBL: most of the workers at ASCo lack the necessary knowledge and skills to work on the starch processing plant effectively. They are mainly low-level educated people who normally follow instructions to work without taking initiatives.
- Price discontentment: ASCo is unable to bargain for better prices since GGBL is offering ‘life-support’ for their operations. The price per metric ton offered to ASCo barely enables ASCo to break even. This translates into lower-than-expected prices for farmers, especially in the lean season when prevailing market prices are higher than what is offered by the partnership.
- Financial difficulties in cassava production: farmers find it difficult accessing funds to help in their cassava production activities since the support they receive from ASCo is not enough to resolve their challenges.

The major challenge of the partnership between ABL and DADTCO-Ghana was the exclusivity of the contractual agreement that did not allow for alternative buyers of HQCC from DADTCO-Ghana. This adversely affected the financial viability of the company when ABL pulled out of the contract. In addition, farmers that produced for DADTCO have generally become disillusioned about the future prospects and viability of the partnership. For example, during the field visit it was not possible for the field officer at DADTCO to organize farmers for interviews and focus group discussions complaining that farmers were unwilling to talk to outsiders because of the disappointment they had suffered when the partnership broke down.

In the case of Caltech and the farmers (since no contractual agreement exists between Caltech and ABL or other buyers):

- First, opportunistic behavior exhibited by some farmers: there are frequent requests for upward review of prices when the going market price is even slightly higher than that offered by Caltech. However, farmers do not ask for a downward review of the price offered by Caltech when the going market price falls. Farmers do not take cognizance of the advantages of the support provided and the cost of running the company (Caltech must break even!);



- Second, socio-cultural challenges: unwillingness of farmers to harvest their fields during periods of social events (festivals and funerals), sometimes leaving Caltech's plant idle. This adversely affects Caltech's production plans.
- Third, there are difficulties in assembling and transporting cassava roots from out-grower farmers who are scattered over a wide geographical area. This is compounded by a very poor road network linking the farming communities to Caltech thereby making transportation extremely difficult.

#### **4.12 Key Lessons Learned**

All the partnerships studied have been recent, the longest being the GGBL-ASCo partnership, which has existed for about three years at the time of the study. The ABL-DADTCO partnership lasted for a little over two years before ABL pulled out; and a formal relationship is yet to start between ABL and Caltech-Ghana. Nevertheless, some key lessons have emerged:

- The partnership as observed by GGBL has not been a smooth business relationship as expected, though there is room for modifications in the contract terms. The inability of government to take decisive action on how to reorganize and operate ASCo as a viable business venture has affected how ASCo could deliver on its promises in a business relationship. An important project like ASCo can help provide a ready market for smallholder farmers if it is well resourced and managed more efficiently.
- Shift from exclusivity clauses in future contracts: DADTCO-Ghana is to refrain from signing any future contracts which contained exclusivity clauses that might prevent them from supplying their products to alternate buyers. This had severely affected the company's fortunes when the buyer (ABL) pulled out of the contract.
- Traceability: DADTCO-Ghana had a mechanism that enabled them trace the source of any contamination in their HQCC (from the farm gate to ABL) ,which was unique. This could be improved upon to enhance both the image and profitability of DADTCO.
- The main lesson learnt from the partnership between Caltech and farmers is the issue of trust in business dealings between parties. Since farmers are certain of Caltech's respect of the terms of their contract (including purchasing any quantity produced by farmers) between them, they are willing to take bold decisions – such as increasing acreages under cultivation.

## **SECTION FIVE: KEY FACTORS DETERMINING TRANSACTION COSTS IN BUYER – FARMER PARTNERSHIPS STUDIED**

### **5.1 Asset Specificity**

The processing plants of GGBL and ABL are specifically designed for the production of beer made from cassava as raw material – Ruut beer and Eagle beer respectively, and can be redeployed at minimal cost for the production of other brands of beer. These costs are associated with changing of parts if a different beverage is to be produced. Investments in machinery by the beverage industry indicate high physical asset specificity. This implies that GGBL and ABL are wont to keep contractual agreements with their partners to ensure continuous returns on investment in the machinery meant for beer produced from cassava. The majority of the employees of GGBL and ABL are trained specialists in the brewery industry, illustrating high asset specificity in human resource and will be redeployed at significant cost (cost of training them for other sectors). ASCo's machinery<sup>4</sup> is highly specific to the production of HQCS, just like the machinery of DADTCO-Ghana for HQCC. In this respect, the lack of market for HQCS or HQCC will come at a great cost to the companies since their processing plants are not easily re-deployable. Only the landed assets (office buildings, bungalows and plant housing) can be redeployed, but at significant cost. On the other hand, investments in trucks by MAXPO TS can be redeployed for other activities at no extra cost, indicating that they are less specific compared to investments made by other parties in the partnership. Apart from land, farmer investments are mainly in agro inputs and farm implements. The investments in agro inputs are hinged on the assurance of a ready market for cassava roots and are highly specific to that purpose. In case of buyer, failure farmers may lose such investments but there were no reported cases of buyer failure, except after ABL pulled out of the ABL-DADTCO partnership.

For the Caltech – farmer model, the high specificity of the assets (processing plant) invested by Caltech to produce HQCF possibly explains why the partnership will be sustained since they (Caltech) anticipate high volumes of supply of roots. Caltech's investment in inputs is done in expectation of higher yields (from farmers), which ultimately improves Caltech's business through returns associated with economies of scale in processing HQCF. The equipment for the processing of the HQCF is specialized for the production of the flour and as such cannot be easily redeployed for any other purpose. The farm facilities such as buildings can be redeployed but at some substantial cost to the company to dismantle and redesign to allow for other uses. Also the human resources (which are mostly specialists in the agricultural and cassava flour production) may have to be trained at high costs for redeployment to other sectors. Farmer investments in this model are mainly in land (for out-growers) and small farm implements (for both block and out-grower farmers). This shows that farmers have not invested in highly specific assets. Investment in the cassava production was significantly borne by Caltech, indicating Caltech's willingness to sustain such partnership for security of supply and business continuity.

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<sup>4</sup> ASCo was established to produce starch for domestic and international markets before the coming into existence of the current contractual arrangement with GGBL.

## **5.2 Frequency of Transaction**

The frequency of transaction between GGBL and ASCo is irregular because in most instances, ASCo is unable to provide the quantity of starch required by GGBL. For this reason GGBL is reluctant to expand its production capacity of Ruut beer. Sometimes the production and marketing plans of GGBL are distorted because of irregular supply of starch. However, the high and constant demand of HQCS from GGBL adversely affects the starch processing plant at ASCo, leading to frequent breakdowns, which adds significantly to the operational cost of ASCo. The desire to keep the partnership demands that GGBL always fund these operational costs. The frequency of transactions between MAXPO TS and ASCo is certain such that the former is able to supply the quantity required by the latter, and the latter always purchases all quantities supplied by the former. Even in situations where there is breakdown of processing plant, MAXPO TS is paid for the service it rendered to keep the relationship. Farmers' supply to ASCo through MAXPO TS is certain, regular and has increased over time due to huge demand of starch by GGBL.

The frequency of transaction between ABL and DADTCO-Ghana was certain and regular prior to the termination of the contract. Because of the certainty and regularity of transactions between ABL and DADTCO-Ghana, the latter was able to meet its cost of production and make profit, thereby staying in business. ABL was also not affected adversely in that its production and marketing plans were not distorted (which could affect revenue generation of ABL if quantity requirements are not met). DADTCO-Ghana made all the necessary investments because of increase in frequency of transactions with the expectation of long-term relationship. The partnership between farmers and DADTCO-Ghana was certain, regular and the frequency of transactions increased during the period of partnership. This led to farmers making further investments by increasing their acreages under cultivation, in anticipation of meeting demand from DADTCO-Ghana. According to Caltech there is certain, regular and increased frequency of transaction with its partners (buyers and farmers). Most often, the quantities of HQCF produced by Caltech are sold within two weeks. The stability in supply by farmers makes it possible for Caltech to make these necessary investments. Because of the certainty and regularity in transactions with buyers and farmers Caltech is able to meet its production cost and makes profits thereby staying in business.

## **5.3 Degree of Uncertainty and Risk in Transaction**

The major risk inherent in the partnership between GGBL and ASCo is the inability of ASCo to always meet the quantity requirement of GGBL. ASCo is also the only producer of HQCS in Ghana and as such GGBL is 'locked-in' the partnership (trade relationship) because there are no alternatives on the local market. Though not a significant risk to the trade relationship, the future price (i.e. price agreed upon for next contract after expiration of one) offered to ASCo is not certain to meet the operational cost and to make profit. There are no major risk-sharing agreements in the partnership between MAXPO TS and ASCo, as any risks are borne by the individual parties. For example, any cassava that is supplied before a breakdown of the plant would be paid for whether it goes bad or not. However, MAXPO TS may provide support for the repair of plant based on humanitarian grounds. Furthermore, there is no uncertainty in the

partnership between MAXPO TS and farmer. This is because MAXPO TS has never refused to buy the produce of farmers.

The main uncertainty to the ABL-DADTCO-Ghana relationship was the inability of the parties to predict changes in consumer taste in the future and the cost of using HQCC in the production of Eagle beer as against other alternatives like HQCS and HQCF. If consumer preference negatively affects the demand for Eagle beer, the uncertainty in the partnership increases since the whole production continuum would be affected (ABL demand for HQCC falls which directly affects the operations of DADTCO and trickles down to demand for raw material from farmers). However, there was certainty in the quantity and quality of HQCC supplied for the period that the contract existed. The certainty of supply decreased transaction costs and as a result promoted stability in the ABL-DADTCO-Ghana partnership, and it encouraged DADTCO-Ghana to assure quality for ABL at least for the period that the contract existed. Until the termination of the contract, there was certainty of supply from farmers and off-take from DADTCO.

There is certainty in the quantity and quality of cassava supplied to Caltech by the farmers, thereby decreasing transaction costs and promoting stability in the Caltech-Farmers partnership as well as encouraging Caltech to assure quality for its buyers. The certainty of transactions with farmers also ensures that unnecessary costs and losses (loss of a market or buyer due to inadequate supply of HQCF because of lack of cassava) are not incurred.

#### **5.4 Externalities or Opportunism in Contracts**

Parties in the GGBL-ASCo-MAXPO-Farmer partnership did not display any opportunistic behavior in their dealings with each other. However, to ensure that there was strict adherence to quality and quantity requirements for HQCS meant for Ruut beer, and that these are not compromised, GGBL deploys staff to monitor the production processes at ASCo. Thus, GGBL acts to prevent ASCo from behaving opportunistically by trying to divert the product to the open market or its competitors. The externality (to GGBL) evident here is the unforeseen cost associated with the deployment of its GGBL staff. ASCo feels they are underpaid for quantities of HQCS they supply to GGBL. An instance of a principal opportunism in the relationship between Caltech and its partners was when some buyers decided to renegotiate the prices for goods (HQCF) delivered. Again, some farmers engage in side selling when the prevailing market prices are even slightly higher than what is offered by Caltech. To curb these practices, Caltech incurs additional cost in monitoring to ensure that contractual agreements are respected.

## **SECTION SIX: CONCLUSIONS AND RECOMMENDATIONS**

### **6.1 Conclusions**

The objective of the study has been to examine the linkages, opportunities, benefits and challenges, amongst others, in three key cassava value chains in Ghana:

- Guinness Ghana Breweries Limited – Ayensu Starch Company Limited – Aggregator (MAXPO Transport Services) – Smallholder farmers
- Accra Brewery Limited– DADTCO-Ghana Limited– Smallholder farmers
- Accra Brewery Limited – Caltech Limited – Smallholder farmers

The analysis of the linkages in each of the above value chains have been based on Asset Specificity, Degree of Uncertainty and Risk of Transaction, Frequency of Transaction, and Externalities/opportunism in the partnerships.

Major players (GGBL, ASCo, ABL, DADTCO and Caltech) in the cassava value chains have invested in assets with high specificity. These assets are mainly the machinery that is specially designed for the various operations in the brewery industry. These highly specific assets may not be re-deployable or if they are, will be at significant cost. Owing to the huge investments in these assets, the tendency that buyers will keep to contractual terms with farmers is high. The lack of market for HQCS or HQCC will come at a great cost to the companies since their processing plants are not easily re-deployable. The termination of the partnership arrangement between ABL and DADTCO-Ghana has come at significant cost to DADTCO since the machinery for processing of HQCC is not re-deployable. Livelihoods of smallholder farmers were negatively affected. Among the buyers, Caltech's unique relationship with farmers (provision of inputs and financial assistance on credit) favours the continuity in the partnership. This exposes the partners to a win-win relationship – farmers have timely access to inputs and funds for farming while Caltech has secured access to raw materials for their operations. Investments in trucks by MAXPO TS can be redeployed for other activities at no extra cost indicating that they are less specific compared to investments made by other parties in the partnerships in this study.

Transaction costs were low in all partnerships studied except the model adopted by MAXPO TS (assembling roots from all over Ghana which came at significant cost). The low transaction costs in the partnerships were due to the fact that farmers were organized. None of the partnerships faced any major risk that could be fatal to their existence save for that between GGBL and ASCo which is reflected in the inability of ASCo to meet quantity requirements of GGBL. The uncertainty with ASCo's inability to meet quantity demanded by GGBL posed a threat to production of Ruut beer by GGBL. ASCo on the other hand, is always in perpetual indebtedness to GGBL as a result of under payment for HQCS delivered. The main uncertainty to the ABL-DADTCO-Ghana relationship was the inability of the parties to predict changes in consumer taste in the future and the cost of using HQCC in the production of Eagle beer as against other alternatives like HQCS and HQCF. If consumer preference changes and leads to a dip in demand for the end product (e.g. Ruut beer), the uncertainty in the partnership increases since the whole production continuum would be affected (i.e. GGBL's demand for HQCC falls and will directly affect the operations of ASCo and will trickle down to fall in demand for raw material from farmers).

Parties in the GGBL-ASCo-MAXPO-Farmer partnership did not display any opportunistic behavior in their dealings with each other. However, to ensure that there was strict adherence to quality and quantity requirements for HQCS meant for Ruut beer, GGBL deploys staff to monitor the production processes at ASCo. Thus, GGBL acts to prevent ASCo from behaving opportunistically by trying to divert the product to the open market or its competitors. The externality (to GGBL) evident here is the unforeseen cost associated with the deployment of its GGBL staff. In spite of the cordial relationship between parties, the contract between GGBL and ASCo is somewhat skewed to favor GGBL because ASCo's bargaining powers are weak – due to ASCo's inability to raise funds for its own operations thereby depending on GGBL for working capital. The price paid by GGBL does not reflect the full benefit ASCo expects from production of HQCS. With regards to Caltech-buyer partnership, some buyers exhibited opportunism in the relationships by trying to renegotiate the price of HQCF sold on credit. Aside this, some farmers engage in side selling when the prevailing market prices are even only slightly higher than what is offered by Caltech. This becomes a negative externality to Caltech since additional costs are incurred to monitor farmer activity to ensure that contractual agreements are respected. In general, the successes of the partnerships between farmers and the buyers stem from ready market, certainty of payment, financial assistance, improved standard of living of the farmers, improved yields and stability of price of the produce. Thus, a reliable buyer assures steady income from cassava production.

## **6.2 Recommendations**

The following recommendations are suggested based on the findings of this study:

In order to ensure efficiency of management of the partnerships, it is necessary that the stakeholders review the relationships developed, including the terms of the contracts under which they operate:

- GGBL should pay to ASCo an appreciable and fixed percentage of the total value of the HQCS supplied to them and not what GGBL thinks would be the expected operational cost of running the company (ASCo) for a month (The parties could contract an independent firm to help establish the real value of the HQCS supplied by ASCo. The firm could consider all important cost and benefit components in the production of HQCS as well as the need for GGBL to recoup investments made in the partnership)
- Future contractual agreements between ASCo and GGBL should allow ASCo to supply more than 1 percent of its total output to any prospective buyer to reduce its total dependence on GGBL and allow ASCo some flexibility in its operations.
- There should be restructuring of ASCo and more investment made in the processing plant to make it more efficient.
- Highly qualified workers with high technical expertise should be recruited to help address the technical challenges facing ASCo in its operations.
- There should be restructuring of DADTCO-Ghana and more investment made in technology to enable the processing plant to produce HQCF instead of HQCC. This must be preceded by comparison of profitability analysis between the two technologies

to ascertain which is better in terms of returns on investment as well as a pricing regime that would be competitive.

- There is difficulty of storage of starch on the part of ABL so it would prefer Consignment Stocking in the future: In this case DADTCO-Ghana or whichever company ABL deals with would produce and store and supply to ABL as and when demanded, shifting liabilities associated with inventory management to the producer, and ABL should compensate for such storage.

### ***For Government and Development Partners***

- Public policy should seek to establish financial institutions with a main purpose of supporting farmers with credit to overcome financial difficulties as regards their production (based on evidence of challenges farmers in partnership with ASCo enumerated). It is anticipated that the support to these farmers will help improve acreages under cultivation which will directly generate employment and increase farmer welfare ultimately.
- Government and/or Development Partners must be encouraged to provide financial support to ASCo to increase capacity to reap benefits from economies of scale in its operations as well as assume a better bargaining position in future contracts with clients (considering that the current contract favours GGBL in pricing of HQCS as a result of ASCo's weak bargaining position).
- Private investment should be encouraged in the operations of ASCo. This could be achieved by floating shares by listing on the Ghanaian stock exchange or entering a public-private partnership with a strategic investor
- Creation of enabling environment which includes provision of public goods like good roads and prompt repairs of road infrastructure to production centres to allow private enterprises in partnership with farmers use their limited financial resources to improve business relationship with clients.

### ***For Value Chain Actors***

- The trust already developed among the partners should continue and be encouraged. Trust and good reputation in dealings between partners in producer-buyer relationships are essential for long term benefits inherent in such relationships. Trust encourages trade partners to communicate in more efficient ways and establish shared visions and achieve set goals.
- Highly qualified workers with high technical expertise should be recruited to help address the technical challenges facing ASCo in its operations
- Out-growers in the Caltech-smallholder partnership should be integrated into the block farm system to eliminate the issue of side selling. In this way, farmers can also be well monitored and regulated just like the nucleus farmers. This is achievable since Caltech currently uses less than 10% of its total land area of 2,500 hectares for block farming.

- To help increase production and expand the market for HQCC, future contracts should refrain from exclusivity clauses so that DADTCO can deal with other market players instead of only one buyer (as was the case in the terminated contract with ABL).



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## LIST OF APPENDICES

### APPENDIX 1

#### Results From Focus Group Discussion/Individual Interviews Smallholder Farmers (Ayensu Cassava Farmers Association (ACFA) ) in partnership with Ayensu Starch Company - Bawdjiase

##### *Assets of the farmers*

All the farmers interviewed at Ayensu own some farm implements, which are mainly hoes and cutlasses. These implements have more than one use and can be used in the cultivation of other crops than cassava. Most of these tools are in good working condition and aid the farmers in the various field activities. Many of the farmers (80 percent) interviewed also own the land on which they farm. Thus, majority of these farmers do not pay rent for the usage of the farmland. The major crop grown on these farm lands is cassava, although a few (20 percent) grow maize on some portions of their farm land.

##### *Relationship with trading partners*

In all, 80 percent of the respondents are out-growers and 20 percent are not. The 20 percent are in two groups. 10 percent do not produce cassava for the Ayensu Starch Company but process the cassava after harvesting into *gari* to be sold to local traders, and the other 10 percent cultivate for home consumption and other uses. Among the rest of the 80 percent of farmers (who are out-growers, forty percent solely produce cassava for ASCo while the other forty percent produce for both ASCo and the local traders. The contract that exists between these farmers and ASCo is formal and thus, cassava is delivered as and when they are harvested. Among the out-growers, 40 percent deliver to ASCo after harvest but at different times throughout the year since they do not plant at the same time, 30 percent revealed that the produce is delivered seasonally. 10 percent also disclosed that they deliver cassava annually (Figure. A.1). This is made possible if the field is demarcated and rotationally cropped.

**Figure A.1: Summary of the Relationship between the farmers and Ayensu Starch Company (ASCo)**



Source: Authors' findings (2015)

Seventy percent of the respondents stated that the price of the produce is decided and fixed by ASCo, although the farmers get other price information from the market women. This sometimes leads to conflict between a few of these farmers and ASCo. Twenty percent of the respondents indicated that the conflict that ensued between them and ASCo was about the pricing system of their produce. This price, according to the respondents, can be reviewed only when the general market prices increase and the cost of living also increases. There is no specific duration for this formal contract, yet 70 percent of the respondents are confident that the business transaction with ASCo is certain. The respondents indicated that the incentives derived from this formal contract include ready and certain market and certainty of purchase and payment. Nonetheless, 10 percent of the respondents disclosed that the local traders give better prices than the ASCo. Seventy percent of the respondents belong to farmer-based organizations (FBO's). The FBO (ACFA - Ayensu Cassava Farmers Association) has a membership of 1024, with subgroups. The highest membership in the sub-groups is 200, with the least membership having 50 members. There are more males in the farmer based organizations than females. Youth make up only 10 percent of membership of the FBOs.

### **Partnership**

The contract between the buyers/traders and the farmers specify the quality standards of the cassava that is sold but not the quantity produced. According to 60 percent of the farmers interviewed, ASCo tests for the quality of cassava that is delivered for processing. The cassava should contain a particular amount of starch before it is accepted and bought by the company. Eighty-five percent of the farmers indicated there is delay in payment such that the money is received two weeks after the cassava has been delivered. The payments are received through receipts, payment vouchers and bank transfers. Ten percent of the farmers (who processed the cassava into gari) disclosed that the local traders also inspect the quality of gari before sale.

Eighty percent of the farmers disclosed that they do not receive inputs from the trading partners (both ASCo and the local traders) nor training on production methods, although 10 percent of the farmers receive training from extension officers and also support in the form of soft loans. This support is received at the beginning of every season. The largest buyer of the produce of 80 percent of the farmers last season was ASCo. These farmers buy their inputs from the open market to produce cassava.

All the respondents transport their produce to their buyers using trucks. Seventy percent of the respondents complained about poor transportation network of their produce to their buyers. High cost of transportation, poorly timed transport services and inadequate trucks are other challenges that are faced by these farmers.

There have been some successes with the partnership between the farmers and the buyers (ASCo and local traders). The majority (75 percent) revealed that there is ready market, certainty of payment, financial assistance, improved standard of living, improved yields and stability of price of the produce. However, the few challenges faced were delay in payment, low price of produce, and need for loans to expand as revealed by 80 percent of the respondents. In conclusion, a reliable buyer assures steady income from cassava production.

### **Overview of the Partnership**

Farmers revealed they have no formal contractual agreements with ASCo. However, the leader of these farmers indicated that about a decade ago they used to have a contractual agreement with ASCo in which ASCo supplied the needed inputs such as agrochemicals and small loans, but that is not the case anymore. Under the current arrangement, the farmers bear every cost of production themselves and for this reason they have an option whether or not to sell to ASCo. However, the farmers stressed that ASCo still provides support to the block farmers.

The group agreed that any farmer who supplies to ASCo is paid the cost of transportation per metric ton from the farm to the processing site, but this amount is fixed regardless of the distance. The group described the relationship with ASCo as bad because of the relatively low price being offered by ASCo. However, the farmers unanimously agreed that ASCo provides a stable price, unlike the spot market where the price can change so many times within a season. There is uncertainty in transaction because of the frequent break down of the processing plant. During bumper harvests, the processing plant breaks down and this creates marketing problems for the farmers, especially those who are yet to harvest. The price offered to the farmer for a metric ton of cassava is established through negotiations between the parties. In doing this the cost of production is considered.

### **Challenges**

First, there is lack of investment capital for land preparation, payments for hired labour, weedicides, etc. Second, the price offered by ASCo per ton is low as compared to the spot market. Third, the transportation cost is fixed per metric ton of cassava regardless of the distance from ASCo to the farm. This is a disincentive for farmers whose farms are very far away from the factory. Fourth, the spot market accepts any cassava, but ASCo does not accept overage cassava. Fifth, there is lack of land for farming because there is competition for land for other activities such as building constructions and related works. Moreover, rent for land is very expensive. The lands used for the production of cassava are mostly owned by the chief and elders, and they charge exorbitant rent for a year. Sixth, currently the labour-intensive approach in the production of cassava does not motivate the farmers. The system of production should be more mechanized where farmers will be provided with tractor services, use of weedicides, etc. Seventh, there is no financial help from ASCo, and for this reason many farmers sell on the open market. Farmers also sell on the open market because they receive support in the form of interest-free loans in times of difficulties from the market women who buy and process cassava roots. For example, a farmer who needs to send a relative to hospital or pay the school fees of a ward can rely on the market women for support, unlike ASCo.

The market women also have patience and understand the social needs and relate well with farmers, unlike ASCo which sees itself as independent of the community. However, ASCo sometimes supports the farmers with funeral donations when there are funerals. In general, the relationship of the company workers and the community is not the best. Open market also is an opportunity for on-the-spot payment, unlike ASCo which has a complex payment structure, including the use of bank, payment vouchers, signature, etc. Eighth, farmers are disappointed with ASCo because of frequent breakdowns of the processing plant. Farmers would be willing to sign contract with ASCo if it was willing to provide good terms, for example provision of tractor services, good price for cassava, interest free loans, weedicides, etc.



## **APPENDIX 2**

### **Focus Group Discussion: Partnership Between DADTCO-Ghana and farmer representative**

#### **Description of Buyer Partner and Incentives to Initiate Partnership**

Mr. K. Adza, who doubles as a farmer and the former accountant of DADTCO-Ghana, represented the farmers for the interview. This is because the farmers are so disappointed and do not want to be interviewed on their relationship with DADTCO-Ghana, due to the termination of the contract by ABL and making it impossible for DADTCO-Ghana to continue to purchase their cassava. He mentioned that prior to the partnership with DADTCO-Ghana, farmers were already cultivating cassava and selling especially on the open market with the support of Help Help Vision (HHV) Ghana, an NGO of which Mr K. Adza was heavily involved. HHV's chairman in Holland got to know of DADTCO-Nigeria and so he contacted DADTCO-Holland (the headquarters of DADTCO) to partner with them so that farmers belonging to HHV Ghana could produce cassava for sale to them. Before this development, DADTCO had already been operating in other African countries like Nigeria, Mozambique, and Cameroon. As a result, DADTCO-Ghana was in Ghana and started its operations in Akwapim area in the Eastern Region of Ghana but was facing challenges with the quality of water in the area. HHV then approached DADTCO-Ghana to relocate its operations to Golokwati in the Volta Region of Ghana.

The operations in the Volta Region started in May, 2012. HHV, which had been dealing with the farmers, provided information on the farmers to DADTCO-Ghana to initiate the partnership with the farmers. At the time that DADTCO-Ghana was contacting the farmers for partnership, DADTCO-Ghana was also initiating a contractual arrangement to supply ABL with HQCC. The farmers were also motivated to partner with DADTCO-Ghana because it would provide a larger and regular market for the produce. In this way the farmers believed they could increase the acreage they cultivate. According to Mr K. Adza, DADTCO-Ghana gave three conditions which were met before it moved to Gologwati. These were:

- There should be clean and regular source of water, specifically a borehole.
- The location should be near a major road for ease of transportation.
- The land should have enough slope to allow for easy disposal of the waste from the processed cassava.

#### **Key Investments**

The farmers revealed that DADTCO-Ghana did not make any investment in the production aspect of the cassava. All investment in terms of land acquisition, purchase of weedicides, cost of labour, ploughing, etc. were borne solely by each farmer. The majority of the farmers have their own lands that are acquired through family inheritance. However, some few large-scale farmers do rent the land when it becomes necessary.

## **Structure of Partnership**

### **Form of the Contract between Farmer and DADTCO-Ghana**

There was a written formal contractual agreement between the farmers and DADTCO-Ghana. However, the contract was binding on DADTCO-Ghana but not on the farmers. This is because at the time of harvest and sale, if a farmer felt the price being offered by DADTCO-Ghana was not good enough, he/she had the option to sell in the open market. Nevertheless, DADTCO-Ghana was obliged to buy so long as the farmer was ready (willing) to harvest and sell to the company (DADTCO-Ghana). Anytime a farmer supplied to DADTCO-Ghana, there was a guarantee form that was given to the farmer to sign. The signing or agreeing to supply to DADTCO-Ghana in the future was optional (i.e. it was not mandatory for the farmer to sell his/her produce to DADTCO-Ghana after harvest).

The guarantee form specified:

- The acreage the farmer was willing and ready to cultivate for DADTCO-Ghana in the next planting season.
- The quantity the farmers was willing or likely to supply to DADTCO-Ghana.
- The price to be paid per metric ton for the season under consideration.

Mr Adza agreed that there was certainty in the transaction with DADTCO-Ghana because it was able to always purchase the quantity it had agreed to buy and even more. The duration of the contract was normally dependent on the maturity period of the cassava. This means the contract was signed after every harvest, which depends on the time it takes for the cassava to mature (usually within 6 months)

### **Quantity Requirements in the Contract**

Quantity requirements were specified in the contract, but it should be noted that the quantity to be supplied was at the discretion of the farmer. This is because DADTCO-Ghana provides no support to the farmers for which some specific quantity needed to be supplied to cover for the cost of support. It is interesting to note that farmers supply the agreed quantity in the contract, and sometimes even more than the agreed quantity.

### **Quality Requirements in the Contract**

DADTCO-Ghana required the following basic quality standards from the farmers:

- The cassava should not be too old (14 months and above). This is because after 14 months the fibre content becomes too high.
- The product should not be rotten or about to do so.
- Farmers suggested that DADTCO-Ghana was not specific with any variety; hence any variety of cassava that the farmers produce was purchased by DADTCO-Ghana.

### **Timing, Delivery and Inspection Procedures**

It was established that the aggregators who have the contacts (phone numbers and locations) of the farmers call them to find out if the roots are ready for harvest and vice versa. If it was agreed by both the aggregator and the farmer that the roots are ready for harvest, arrangements

were then made to mobilise up-rooters (harvesters) within the community of the farmer. After the harvest, DADTCO-Ghana transported the cassava roots to the processing site using its own trucks. The cost of up-rooting and transportation from the farm to processing site was borne by DADTCO-Ghana. DADTCO-Ghana always made arrangements with farmers on when to supply.

### **Pricing Strategy and Payments Modalities**

According to the stakeholders, the price offered for a metric ton of cassava roots was predetermined from the headquarters of DADTCO in Holland. The pricing was based on a formula designed by IFDC. The IFDC takes into consideration:

- Global average cost of producing a hectare of cassava.
- Application of best agronomic practices that result in optimum yield.
- The commodity price of cassava across the globe (especially the amount DADTCO headquarters is paying for in other countries it is operating in, such as Nigeria).

Prices are reviewed periodically and at the discretion of the headquarters of DADTCO in Holland. Payments for the roots are made in full immediately after delivery of product and this is one aspect of the arrangement farmers are mostly happy with because in the spot market they are normally paid in instalments. There is no deduction of any sort from the payment made to the farmer. This is because all the cost of production was incurred by the farmer alone. Calculation for the price offered and payments are made in US dollar terms from the headquarters but payments are made in the local currency (Ghana Cedi) to the farmers.

### **Risks in Partnership**

Any risks in the partnership were borne solely by each party, as revealed by the farmer. If in the course of production there is disease or pest infestation resulting in losses, the farmers bear them alone. DADTCO-Ghana provides no help or support in that direction. At the time of this study, over 140 farmers who had cultivated cassava for DADTCO-Ghana were not pleased due to the fact that the company had shut down and stopped buying the cassava roots (because of the termination of the contract between DADTCO-Ghana and ABL). Although the farmers could take legal action against DADTCO-Ghana, they are not exploring this option. This may be due to lack of education of their right to do so. Indeed most of the farmers were unhappy with DADTCO-Ghana about what has happened because the crops were ready for harvest and there was no market for them.

## **APPENDIX 3**

### **Focus group discussion: Partnership between Caltech Limited and Farmers**

#### **Assets of the farmers**

Every farmer interviewed owns some implements. These implements can be used for more than one activity at minimum or no cost. The tools including cutlasses and hoes are used to cultivate cassava and are in good working condition. Eighty percent of the respondents own the land on which they farm. This reduces their cost of production since it eliminates the cost of renting a land. The largest farm size owned by a respondent is 100 acres whilst the smallest farm size is 5 acres. All the farmers produce cassava on their farm lands and sell to Caltech.

#### **Partnership**

Forty percent of the respondents are block farmers, with the remaining 60 percent being out-growers. This relationship evolved through the assistance Caltech gave to the farmers. The company was introduced into the community and the farmers took advantage of the opportunity. The company assists the out-growers and block farmers in some activities such as land preparation and ploughing. The contract that exists between 80 percent of the respondents is formal and that of the 20 percent is informal. Out of the 80 percent, 70 percent disclosed that the duration of the contract is one year and 10 percent disclosed that their contract lasts over one year. Those with the informal contract do not have a duration for the contract. The formal contract specifies the standards of the cassava which is usually based on the type of variety that is planted. However, the basic standards include fresh, healthy undamaged roots, high starch content and that it should not be overly matured (8-12 months is preferable).

The farmers agreed that Caltech does not specify the quantity that they should produce or harvest at a particular time period. However, there are quality standards that must be met and these include:

- The cassava must have high starch content
- It should not be overage (i.e. not more than 14 months) for which the cassava becomes too fibrous and the starch content reduces.

To ensure that these standards are met there is physical examination and laboratory testing of the cassava. Before a farmer harvests his/her cassava, a sample of his or her crop is harvested, examined and tested and approved. Farmers argued they could not understand why Caltech would reject a cassava based on starch content as planting material was recommended by Caltech, though they agree Caltech hardly ever rejects the roots. The farmers' leader revealed that plans are far advanced to recommend only two varieties for farmers in the coming season.

Caltech is the largest buyer of the produce of the farmers in the area where it operates. All the farmers sell their produce to Caltech. However, according to 80 percent of the farmers, the price of the produce is negotiated at the beginning of the season. This negotiation is done between the farmers and the representatives of the company. However, 20 percent disclosed that the price of their produce is determined solely by Caltech. The respondents/farmers gather information on prices of various commodities from market women, friends and also from

Caltech. Eighty percent disclosed that payment is received immediately after the produce is delivered and 20 percent said payment is received two weeks after the produce has been delivered. Seventy percent of the respondents save with banks whilst 30 percent do not.

The farmers receive various forms of assistance from Caltech, some of which include credit and loans, agrochemicals, assistance in land preparation, technical advice, funeral donations and provision of inputs. These serve as incentives for the farmers to continue to partner with the company. The costs of the assistance are deducted from the sales of the produce. It is worth noting that 60 percent of those interviewed have alternative sources of inputs. Terms and conditions of the partnership require that a farmer will receive credit from the company and the farmer should adopt good farming and management practices. The farmers mentioned that there are conflicts regarding the timing and usage of tractors. There are not enough tractors to be used by all the farmers. All the farmers suggested that there are measures that have been provided in the contract for conflict resolution and these measures include dialogues, deliberations and negotiations with the concerned parties. Further, there are challenges regarding the transportation of the produce to the company. According to the farmers interviewed, 60 percent said there is unavailability of transport services and delays in transportation are the major challenges. The other challenges include the farmers' inability to access loans from the banks and the high interest rates on these loans. All the farmers indicated that the main success of the partnership is the ready market for their produce.

### **Overview of the Partnership**

This Farmer Based Organization (FBO) comprises both block and out-grower farmers who are in partnership with Caltech. From the focus group discussions with members of CCOA, it was confirmed that Caltech is the major buyer of the cassava produced in the catchment areas. Farmers described the relationship with Caltech as good but they believe it can be improved. They suggested that the price offered by Caltech can be improved upon since the current price being offered per metric ton in their opinion still remains much to be desired. However, the farmers hoped that because of the cordial relationship they have with Caltech the situation will improve in the near future, especially as Caltech is about to begin ethanol production. According to the group, the relationship with Caltech started when the company was established in the community three years ago. Farmers were invited to produce cassava for the company since the company alone cannot produce enough to feed the factory. By then Caltech had acquired 2500 hectares of land. Hence, some farmers were allocated some part of the land for cassava cultivation (block farmers) while others were out-growers. The partnership has led to a constant and regular supply of roots to Caltech. About 35 percent of cassava that the company processes comes from the out-growers. Currently the block or nucleus farmers are 35 and the out-growers are 180. Members also confirmed that they have a formal contractual agreement with Caltech which is valid for a year and can be renewed depending on whether the farmer largely abides by the specifications in the contract for the year under consideration. The farmer association has a constitution that governs the activities of members and each farmer has a copy of the constitution to be abreast with the rules and regulations governing the association.

The price that is agreed for a metric ton per season is arrived at through negotiations with the farmers. However, a few farmers disagreed, saying it was mostly given or dictated by Caltech, but further probing revealed that those farmers who said that the prices are dictated by Caltech are mainly farmers who do not attend such meetings to deliberate on such matters as the price and therefore do not have the information on how the price is determined. To ascertain that the pricing is done through negotiations, some farmers who attended the meetings showed a copy of the crop budget on which the price is based to the research team (on their mobile phones). Farmers also agreed that Caltech provides land for free for those working on the block farm and each farmer is allocated between 1.5-5 hectares. Farmers whether on block or out-grower scheme are also given inputs such as planting materials, agrochemicals etc. Caltech also ploughs and ridges the land for the farmers and provides financial capital. The money provided is used to mainly purchase farm tools such as hoes, cutlasses and payments for hired labour. Thus, the only major difference between the block farmers and the out-growers is the free land. It must be noted that there are farmers who do not want the free land because their residences are too far from the land meant for the block farm.

Some farmers indicated that they were given \$16.25 as operation cost for 2 hectares for which they complained that the money was woefully inadequate. However, further probing by the research team revealed that Caltech gives the money according to the hectares being cultivated by the respective farmers. Thus, some farmers who cultivate few hectares would like to get as much money as given to those who cultivate large hectares. The focus group revealed that Caltech has approved seven varieties of cassava for the farmers' cultivation, and out of these seven varieties, each farmer then decides which variety he/she would cultivate. From the views as expressed by farmers, there is certainty in transactions because at any time the produce is harvested, Caltech is ready and willing to buy. Caltech also provides means of transport by using its own trucks to transport the cassava roots to the processing site. The group also indicated that Caltech is also honest and transparent in its dealing with the farmers.

## **Challenges**

The challenges confronting the partnership include the following: Timing and usage of tractor, trailer, bulldozer and truck services: many times there are clashes in the use of equipment, as Caltech considers the block farmers first before the out-growers. Most often the two systems (block and out-growers) start all agronomic practices at the same time and the equipment is not adequate to serve all farmers at the same time. Situations like this pose a serious challenge to farmers especially those under the out-grower system. Some farmers also do side selling: there was an instance where one farmer was taken to court. This was a very recalcitrant farmer the company used as example to deter other farmers from engaging in such practices. In this case, even the farmer association supported the action of Caltech. It must be noted that Caltech rarely uses this approach as indicated by the group.

The group recommended that the following should be done to ensure smooth and continuous existence of the partnership:

- The out-growers should be provided with tractors and trucks that will not be under the ownership of Caltech. Private service providers should be encouraged to take this responsibility at a fee.

- Increase in the financial support being given for the farming activities so as to increase the acreage that is put under cultivation by the farmers.
- Improvement in the price per metric ton of cassava offered by Caltech.

### **Dispute resolution**

Farmers revealed that disputes hardly arise, but where they do, they are resolved through dialogue with the management of the company. If the cost of hired labour increases thereby increasing the costs of production, farmers meet with the management of the company for a possible upward review of the price to be paid per metric ton of the cassava. Cash payments are made immediately after delivery of the product because majority of the farmers do not have bank accounts.

### **Successes of the Partnership**

The group indicated that the success chalked as a result of the partnership with Caltech include the following:

First, farmers get a ready market for their produce, unlike before the partnership when there were lots of post-harvest losses. Closely related, Caltech is able to buy all the cassava produced by the farmers, unlike market women who buy what they can and leave the rest of the product to the farmer to find alternative markets. Thus, Caltech's ready market resulted in increased income and profit to the farmers. Second, there has been increased employment in the catchment area. Thus, before the establishment of Caltech, a lot of the youth normally migrated to the urban areas but that has reduced considerably because they know they can farm and make some money even if they are in the village. Third, in general, the farmers' struggle to find tractor services for land preparation has also reduced drastically because of the partnership with the Caltech. Fourth, the company supports the social needs of the farmers. For example, the company makes donations in times of funerals and naming ceremonies

#### APPENDIX 4: SWOT ANALYSIS OF PARTNERSHIPS

STRENGTHS	WEAKNESSES	OPPORTUNITIES	THREATS
<ul style="list-style-type: none"> <li>- Ready market for farmers</li> <li>- Reliable source of income for farmers with price stability for produce</li> <li>- Increases in productivity for farmers and ASCo</li> <li>- Reliable sources of roots for continuous operations by agribusiness firms</li> <li>- Challenges associated with transportation of roots from farm gate to processing plants eliminated.</li> <li>- Easy access to appropriate technology for cassava production by farmers</li> <li>- Strong technical support to farmers to help improve productivity.</li> </ul>	<ul style="list-style-type: none"> <li>- Supply constraint: inability of processing firms (e.g. ASCo) to meet quantity requirement of partner (GGBL)</li> <li>- Managerial challenges – poor skilled labour (e.g. at ASCo)</li> <li>- Difficulty in accessing funding for all farming activities by farmers</li> <li>- Socio-cultural challenges, including strong farmer attachment to social events, which affect productivity.</li> <li>- Poor road network in catchment areas of companies, making it difficult to transport roots to processing plant</li> </ul>	<ul style="list-style-type: none"> <li>- Increased food security status by farmers (as a result of increases in income)</li> <li>- Improved cassava varieties made available to farmers i.e. improved technology to increase productivity</li> <li>- Provides opportunity for government to initiate and implement policy to support such partnerships (e.g. initiation of public-private partnerships in other publicly owned irrigation schemes across the country)</li> <li>- Public– Private partnerships help in improving investment in value-chain activities, leading to economic growth</li> <li>- Incentive available for farmers to increase acreages under cultivation</li> <li>- Creation of employment opportunities for farmers and other value chain actors</li> </ul>	<ul style="list-style-type: none"> <li>- Dependence on rainfed agriculture could lead to heavy crop failure if drought occurs</li> <li>- Climate change effects</li> <li>- Political instability</li> <li>- Increasing urbanization could create pressure on land, resulting in decrease of agricultural land for cassava production</li> <li>- Sudden changes in public policy restricting companies in partnerships from operating</li> <li>- Trans-boundary cassava diseases could lead to heavy crop failure</li> </ul>