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The Case of Tomato in Ghana: Marketing

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THE GHANA STRATEGY SUPPORT PROGRAM (GSSP)
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Table of Contents

List of Tables

List of Figures

Introduction

In Ghana, the agricultural sector in general and the tomato sector in particular have not met their potential. In the tomato sector, production seasonality, the dominance of rainfed agriculture, high perishability of the fruits combined with no storage facilities, and poor market access, have resulted in low average yields but seasonal gluts with some farmers unable to sell their tomatoes which are consequently left to rot in their fields.

The tomato value chain in Ghana is characterised by a “two level” system in which itinerant traders—the market queens —are the direct link between rural farm producers and urban consumption, rather than by a set of assembly markets which bulk the produce before being sold to urban wholesalers at relay markets. Assembly markets enable inspection, grading, and better price transmission, but the time taken to get the crop from farmgate to consumer is relatively long. The two-level trader system reduces delays of passing through assembly markets, allowing rapid movement of the produce from producer to consumer, important for highly perishable agricultural products such as tomato, but fragments price signals resulting in poor spatial price adjustments (Bell et al.1999; Orchard and Suglo 1999). In a two level system, farmers are distanced from market signals: most wait for the market queens to come to their fields and if these traders do not come, farmers leave the tomatoes to rot in the field in the absence of a local market. Traders allocate a certain number of crates, which determines how much farmers can sell on that particular day and there is little if any room for price-quantity or price-quality negotiations. Signals from consumers with respect to quality, price, and quantities demanded, are not transmitted back along the value chain to the farmers. Though packers may remove the poorest quality fruits, tomatoes of different qualities and even different varieties are not graded but rather simply piled them into over-sized crates.

A key feature of the tomato sector in Ghana is the organisation and strength of the market queens, who effectively control distribution networks and the number of trucks of tomatoes that can enter the larger wholesale markets on any particular day. In the press and the grey literature, these market queens are variously portrayed as the only group in the tomato value chain which is disciplined and organised, reducing risk, uncertainty, and spoilage of what is a highly perishable fruit; or as a cartel to the detriment of both consumers who pay inflated prices and producers who receive lower prices or get no market at all. In reality, the impact of Ghana’s tomato traders on the sector is not sufficiently understood. But certainly, the two level marketing system has enabled market power to evolve and concentrate over time with the traders.

It is against this backdrop that we explore tomato marketing in Ghana. Our focus in this document is the linkages between farmers, traders, and retailers. Details on production and processing can be found in separate technical notes. The information in this document comes from a number of sources including the market traders themselves, who have produced their own document outlining their perspective on the tomato trade (Tomato Traders report to IFPRI 2009); interviews with farmers and other actors along the value chain; peer-reviewed and grey literature; and our own farmer and market surveys. Because there are very different perspectives on the role of the market traders, we rely as much as possible on verifiable information and data, but also provide a sense of the different and nuanced perspectives on traders and their role.

Seasonal and geographical production of tomato leads to considerable movement across space extending to the region

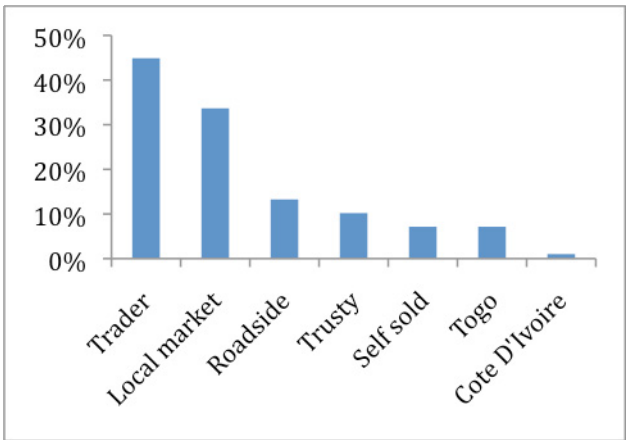
Highly seasonal and geographical production, combined with strongest demand for tomatoes in the southern half of Ghana, drive the flow of tomato across space and time. In late December through April/May Ghana's Upper East region and Burkina Faso supply almost all the fresh tomato in the country. From June onwards the harvest picks up in the rainfed areas, with a longer rainfed season in Brong Ahafo and Ashanti regions (reflecting bi-modal rainfall patterns) and a shorter season in Greater Accra. Irrigated tomato from Greater Accra dominates the market later in the year.

The largest wholesale markets for tomato are in Kumasi and Accra (Makola and Agbogbloshie), located near to the largest consumption areas. Other important markets in Techiman (Brong Ahafo), Tamale (Northern Region), and Navrongo (Upper East), are located in key growing areas. The market queens have strong control over these larger markets located near to key consumption areas, restricting who can bring tomatoes to the market and how many trucks can bring tomatoes to the market on any one day. The smaller markets located around the key growing areas are unrestricted and farmers can often take their own produce to these markets to sell

Regional trade is becoming increasingly important, with market traders from Ghana's neighbouring countries crossing the border to purchase tomato, and Ghana's traders increasingly relying on tomatoes from Burkina Faso during between January and May when the only region in Ghana producing significant volumes of tomato is the Upper East. In our Three Region Survey, out of 99 farmers we surveyed one farmer sold to a trader coming from Cote D'Ivoire and seven sold to traders coming from Togo.

There are three large-scale tomato processors in Ghana that, when functioning, provide an additional market for tomato farmers: Wenchi in Brong Ahafo; Northern Star (formerly named Pwalugu) in Upper East; and Expom (formerly named Trusty Foods) in Greater Accra (Robinson and Kolavalli 2010). These processors are located in key growing areas but the former two have only been running intermittently if at all during the past two decades and the third relies heavily on imported bulk tomato paste. However, in our Three Region Survey approximately 10 percent of farmers sold at least some of their harvest to Trusty Foods. Figure 1 summarizes the different marketing routes used by farmers participating in our Three Region Survey.

Figure 1. Percentage of farmers who used different marketing routes (multiple responses allowed)

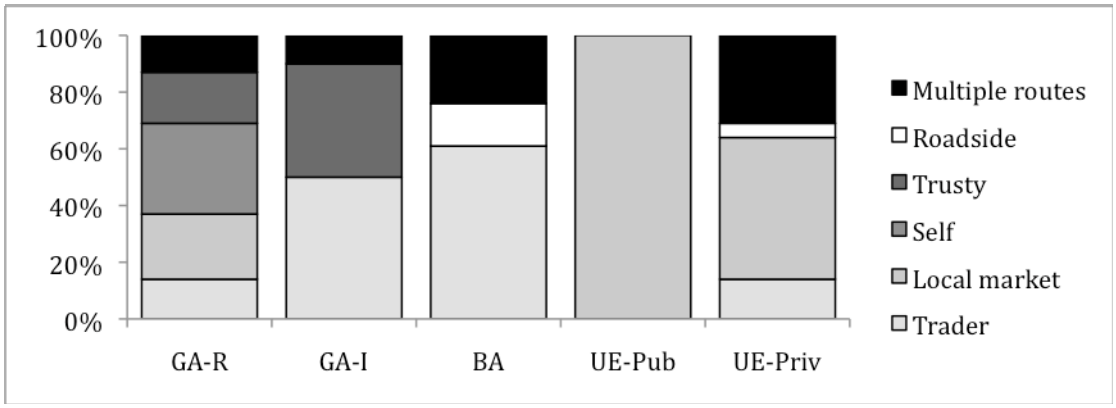


Source: Three Region Survey 2009.

Overall, 83 percent of farmers sold exclusively through one marketing route, whereas the remaining 17 percent of farmers sold via multiple marketing routes. Key market routes for farmers are the itinerant traders (the market queens) and local markets. Thirty one percent of farmers sold exclusively to traders and 28 percent exclusively to local markets.

Market routes differ by region and by village. Figure 2 shows the proportion of farmers in each region or sub-region that sell exclusively through one particular marketing route. In Greater Accra, rainfed farmers sell through the greatest variety of marketing routes; whereas irrigated farmers sell mainly to traders and Trusty Foods; farmers in Brong Ahafo primarily to traders; and farmers in the Upper East predominantly to local markets, with few selling to traders.

Figure 2. Importance of different market routes by region



Source: Three Region Survey 2009.

Local markets are particularly important for farmers who produce small quantities, whose farms are a long distance from the well-known tomato production areas, and those producing in the off season.

Apart from the usual functionaries in the market, “lead boys” play an important role

Over 90,000 farmers are estimated to be involved in tomato production, and more than 300,000 individuals in the retail and wholesale sector (Trader Report to IFPRI 2009). An estimated 25 people are involved in getting one tomato from plot to plate, including day laborers working in the fields; haulage truckers; the men who load and unload the tomato crates onto and off the trucks; porters; and the restaurant and chopbar owners who are important consumers of tomato (Trader Report to IFPRI 2009). In this section we summarize the activities of the different key players. In a two-level marketing system, intermediaries are particularly important. In the tomato trade, the key intermediaries are the tomato traders and the “lead boys” the latter playing an increasingly important role in linking traders to farmers.

Figure 3. Conceptualising key players in the tomato value chain

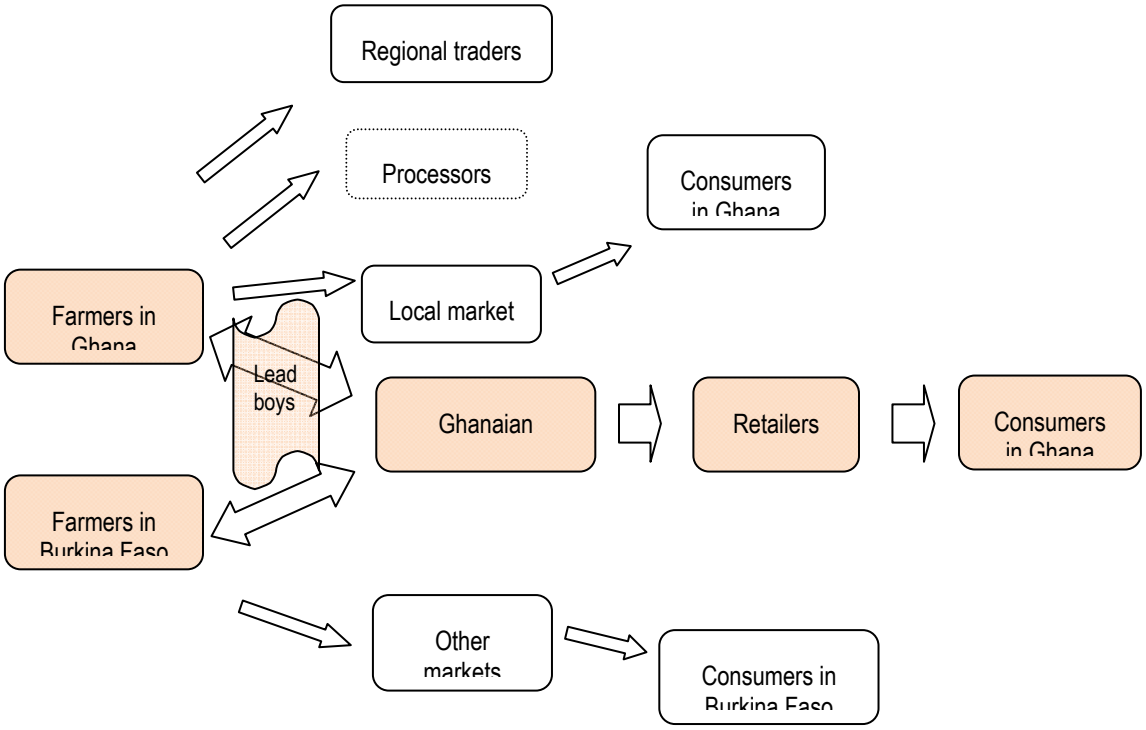


Figure 3 shows the key players in the tomato value chain and highlights the “two-level” marketing route. In focus group discussions tomato farmers suggest that the most organised and powerful players along the tomato value chain are the traders, closely followed by the lead boys and the transporters (Table 1). Farmers’ rankings were influenced primarily by their perception of the influence each group of players exercise over decisionmaking and price determination. Farmers see themselves and the consumers—the groups at either end of the commodity chain—as least powerful, being passive acceptors of prices that are driven by traders. In contrast, the traders and lead boys, at the centre of the value chain, are perceived to be most powerful—determining whose tomatoes are collected and taken to the market, and thereby influencing prices at the farmgate and the urban markets.

Table 1. Farmers' power ranking along the Burkina Faso–Ghana tomato chain

Actor	Power Ranking	Reason
Producer	3	Little control over resources, prices, and market
Lead boys	1	Determine who the market queens should buy from; key role in price negotiation and facilitate the movement of tomato across the border; "speak the language of the buyer and the farmer"
Market queen	1	Strong control over product distribution, traders need permission to sell in markets under their control
Transporter	2	Role is critical in ensuring that tomatoes from the farmer reach the final consumer; but depend on wholesalers for business
Retailers	3	Little control over resources and rely on traders for supply, sometimes on credit
Input supplier	2	Critical to ensuring farmers have necessary inputs for production
Consumers	3	Preferences are not transmitted back along the value chain to influence tomato varieties

1=most powerful; 2=powerful; 3=least powerful

Source: Yakubu Project Report to IFPRI 2009.

Traders depend on lead boys for information on where tomatoes are available

Lead boys provide a mechanism to match market queens looking for tomato with farming communities that are ready to harvest. The lead boys typically find out the location, volume, and quality of available tomatoes, and often play a role in price negotiation. They are particularly important for the cross-border trade between the Upper East region and Burkina Faso where they also take on the role of translator and facilitating the border crossing, but they are also prevalent in other regions such as Brong Ahafo. Lead boys and traders typically have long-term relationships, often of ten years or more. In Brong Ahafo the key role for lead boys is aggregating for the traders—a reflection of the small size of farms such that the harvest from several farms is needed to fill a truck. They also supervise loading the tomatoes onto the trucks. Larger-scale farmers who can supply all the requirements of a trader typically have established relationships with traders and so do not need the involvement of a lead boy.

Market queens are the single link between growers and large markets

Market queens, the itinerant traders who are critical link between farmers and consumers, travel throughout the region purchasing tomatoes from individual farmers and communities. The traders, who bring their own crates and transport, typically negotiate prices with a small group of farmer representatives, after which the farmers take the crates and harvest. The traders then take the produce directly to the major urban centres, such as Kumasi and Accra, where they sell the crates to retailers. There are estimated to be 5000 tomato traders, variously called itinerant

traders or market queens, in the country, over 85 percent of them being women between the ages of 21 and 65 for whom the trade in tomatoes has been a lifelong vocation, passed on from parent to children and relatives (Tomato Traders report to IFPRI 2009; Trading Up).

Some farmers have long-term relationships with traders. The farmer will often tell the trader when he is ready to harvest and she will come specifically to his farm. These bilateral relationships build up over several years and often involve informal credit transactions—whether the trader providing the farmer with credit to purchase inputs, or the farmer provided the trader with his tomatoes on credit, to be repaid after they are sold in the market. Farmers who have such types of relationships are more likely to be able to sell their tomatoes. However, for many farmers, no such special individual or community relationship exists, and they must rely on "lead boys" to bring the traders to the particular community and the community representatives to negotiate conditions and prices on behalf of all the tomato farmers. Our Three Region Survey found that approximately 40 percent of farmers sold their produce to more than three traders, and 30 percent to two or three traders, with only 30 percent of farmers selling to just one trader, suggesting that much of the time farmers sell opportunistically to whichever trader is at their community.

Traders use their organizational power to control the quantity of tomato that comes into large markets.

Traders are well organized. The National Tomato Traders Association was formed in the 1980s. A key purpose of the traders' association is to reduce price fluctuations and reduce the probability of traders being unable to sell their tomatoes at a price that covers their costs, or even at any price, particularly during the peak period when the prices typically fall significantly. Central to their activities is the control of tomato volumes entering the wholesale market. This is achieved by allocating a day on which a particular trader is permitted to take a truck to collect tomatoes from the farm gate and bring them to the market. The trader does not have to specify from where they are collecting, though they have to have separate permission to go to Burkina Faso. Traders then are expected to work with drivers and trucks affiliated with the national transport union when organising a truck to take to the farms.

The traders describe the scheduling in the following way. Over the past few decades the trade has evolved such that a particular group of traders joins one vehicle. Each trader brings into town between ten and twenty crates each week depending on their access to cash to purchase the tomatoes at the farmgate. Each trader is allowed to enter the market with her produce twice a week. "Among the traders themselves, this is a culture to allow participation because of the teeming number of operators in the metropolis and the need to fight the glut and protect investments—as well as ensure consumer satisfaction" (Trader Report to IFPRI 2009). The controlled access to markets is not typical of market trader associations outside of Ghana, which tend to focus on dispute resolution, infrastructure improvement, market management and information, and quality improvement (Shepherd 2005).

In practice tomato traders organisations to which the market queens belong fulfil many roles. The associations have evolved in response to a number of problems in the tomato sector, including farmers and traders not always honouring payment agreements and perceived high transport costs; reducing overloading of trucks; organising and monitoring the cross-border trade from Burkina Faso; and introducing a levy per truck going to the farmgate to provide funds to cover medical and funeral expenses for traders involved in accidents and attacks while transporting tomatoes (Trading Up). Dangers on the roads, whether accidents, robbery, or extortion, remain uppermost in the concerns of the traders (personal communication).

Restriction of access to markets can adversely affect both producers and consumers

Restricting access to the major markets has a number of effects. First, when the access restriction is binding, retail prices in these major markets are higher than they would be without restrictions and tomato consumers are worse off. Second, the likelihood that traders and retailers will not be able to sell their tomatoes before they perish is reduced, a clear benefit for both sets of actors. Third, some farmers who are not able to sell to traders, may not be able to sell their tomatoes. In our survey of three regions, we found that in the Upper East region, over 50 percent of farmers reported not being able to sell at least some of their harvest due to a lack of market, compared with 16 percent in Greater Accra and 12 percent in Brong Ahafo. These farmers are unambiguously worse off. The other farmers who do sell to traders may be better off depending on whether traders pass on to them the higher prices, but our observations suggest that traders usually peg prices to those farmers are able to get in local markets. Fourth, some farmers who cannot sell to the traders can sell in the nearby local markets. If more produce is entering these markets as a consequence of access restrictions in the larger urban markets than would be otherwise, then these consumers are better off and the farmers who sell worse off, relative to the no-access-restriction scenario.

Retailers pay more attention to grading than other groups along the value chain

Traders often have retailers that they deal with regularly who wait for their tomato trucks to arrive from the production areas. The retailers require up to six men, paid in kind, to help off-load the crates from the trucks (as observed in Makola market, Accra). Retailers must purchase a whole crate, and so those who want less join up with one of more retailers. The retailers either sell their tomatoes at the main urban market or sell them on to retailers in smaller markets in the city. When selling directly to the consumer, they will sort and grade the tomatoes according to quality, including size, firmness, and blemishes.

Retailers sell tomatoes by container (volume) and quality rather than weight. In Makola market in Accra in January 2010, we observed individual retailers offering several qualities of tomatoes and typically four to five different volume containers. Smaller tomatoes are sold for a lower price. Lower quality tomatoes that are split, squashed, or deteriorating are sold to chopbars who will cook them immediately. Once the quality deteriorates more, the tomatoes are left to rot, then are washed and the seeds extracted for sale.

Even when organized, farmers have little market power as their only access to large markets is through traders

Price setting depends on market conditions and the relative bargaining power of the traders and farmers representatives. Although there are tomato-based farmer-based organisations (FBO), tomato farmers in general are not well organised. When a trader comes to the community, either leaders of the FBO or an informal group of two or three lead farmers, often older, more respected farmers, who have bigger farms, and so are likely to have better bargaining power with the traders, negotiate crate allocation (quantity that would be purchased) and prices (Awiti-Kuffuor report to IFPRI). Formal or loose associations of farmers are reported to have more control over prices during the off season, when tomatoes can be sufficiently scarce that more than one trader comes to a particular farmer. But in general farmers report that they have little if any power over price setting because a trader can always walk away and collect from a different farmer or a different area altogether.

Because price setting between farmers and traders occurs before traders go to farmers' fields, and the price is negotiated for the top quality tomato, traders may try to negotiate the price downwards when they see the tomatoes if they feel that quality is lower than anticipated. Farmers usually have little success in dictating the terms between themselves and the market queens. Traders supply the farmers with crates—thus determining the quantity that will be purchased, which may be less than the farmers would have chosen to harvest—and transport the filled crates to the market.

Farmers have been more successful in pressing the government to operate processing facilities

Tomato growers in Upper East, for example, have been instrumental in pressuring the government into reopening Pwalugu processing plant in the 2009–2010 season. They reportedly worked through the regional minister who brought in other relevant organizations. The parliamentary sub-committee on agriculture also got involved by setting up a committee of representatives from MoFA, ICOUR and the Northern Star Company to examine the situation and recommend a strategy. Having examined the operational costs of the factory and crop budgets submitted by farmers, the committee recommended that farmers by paid GH¢5.40 per crate of 40 kg in addition to transport costs. The government also made funds available to the factory to procure tomato from growers in the region.

Import of tomato from Burkina Faso has soured the relationship between growers and traders

The growth of the cross-border trade in tomatoes from Burkina Faso to Ghana, coupled with the collapse of the Pwalugu processor, has had a large impact on the tomato value chain, affecting the farmers in the Upper East region in Ghana negatively but introducing what the traders claim to be a higher quality of tomato that has greater storability than most tomatoes grown in Ghana and appears to be preferred by consumers. Before 1996 there was not a large amount of cross-border trade in tomato between Burkina Faso and Ghana (Trader report to IFPRI 2009). However, in 1996, the harvest in the Upper East region was much smaller than usual and there was a relative shortage of tomatoes. The traders therefore started going across the border to Burkina Faso where they had heard that tomatoes were being grown. The presence of Ghanaian traders in large numbers most likely encouraged more Burkinabe farmers to grow for the Ghanaian market. ICOUR (personal communication) suggest that cross-border was further encouraged by low production of tomatoes in 2003–2004 because of a disease outbreak in the Upper East region. After 2003, although production improved in the Upper East region, it has been highly variable, in part due to farmers' reluctance to cultivate tomato when they perceive that their access to the tomato market may be poor.

In 2006 there was a major confrontation between traders and tomato growers in the Upper East region when farmers blocked trucks filled with tomato from Burkina Faso coming into Ghana. Since then the general feeling is that the relationship between traders and the farmers has soured. The traders maintain that the quality of the tomatoes from the Upper East is lower than from Burkina Faso, in particular tomatoes from Burkina Faso travel better and last longer. Farmers insist that the tomatoes they produce are no different and traders have other motives for going to Burkina Faso.

Farmers have now negotiated an agreement with traders using transporters as their allies

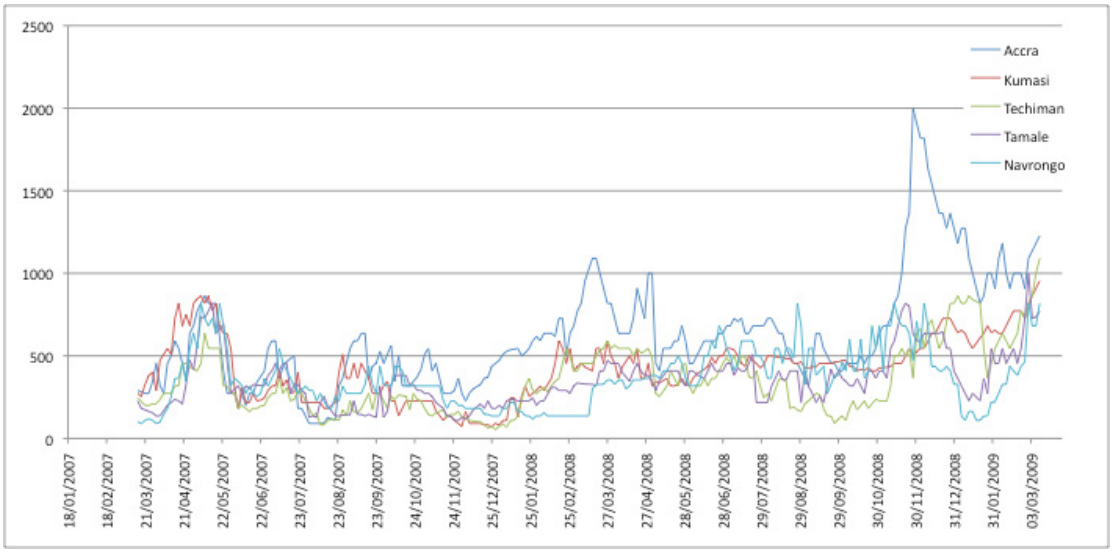
There has been what might be termed a rapprochement of sorts beginning with a meeting of traders in Kumasi to which farmers and transporters were invited. The traders apparently sought

help from the transporters concerning issues of harassment on the Burkina Faso side of the border, accidents and breakdowns, and safety. There was also discussion concerning purchase of tomatoes from Upper East farmers. These discussions were followed by negotiations among traders, transporters and growers in Bolgatanga. The parties are reported to have signed a memorandum of understanding which the regional minister has agreed to enforce with the assistance of the customs, local police and the border security force. The agreement is reported to include the following: (1) transporters will work to ensure the smooth flow of trucks across the border, reducing harassment, follow agreed protocols in case of accidents and breakdowns, and to charge for partial loads rather than a flat fee per truck; (2) producers and transporters will send the traders “requests” number of trucks needed to collect local production; (3) traders, based on these requests, will allocate trucks either to the Upper East or to Burkina Faso and issue permits; (4) checkpoints will be set up on either side of the border to monitor truck flow; and (5) any downward movements in farm gate prices must be negotiated.

Tomato prices fluctuate widely for obvious reasons but major markets are integrated for the most part

Although irrigated tomato production dominates in the Upper East region, tomato is predominantly rainfed and highly seasonal and perishable fruit with no current options for storage in Ghana. Prices in the wholesale markets fluctuate considerably over the year, reflecting the spatial-temporal variation in production, influenced by weather patterns, access to irrigation, and supply from Burkina Faso. Prices in the larger controlled markets are also heavily influenced by trader access restrictions. Price series data, with data collected twice a week from the key wholesale tomato markets exhibit considerable variation over space and time (Ihle and Amikuzuno 2009). We reproduce the data below, for the five markets at Accra, Kumasi, Techiman, Tamale, and Navrongo (Figure 4).

Figure 4. Tomato prices (GH¢ per ton) in five key markets in Ghana



Source: Adapted from Ihle and Amikuzuno 2009.

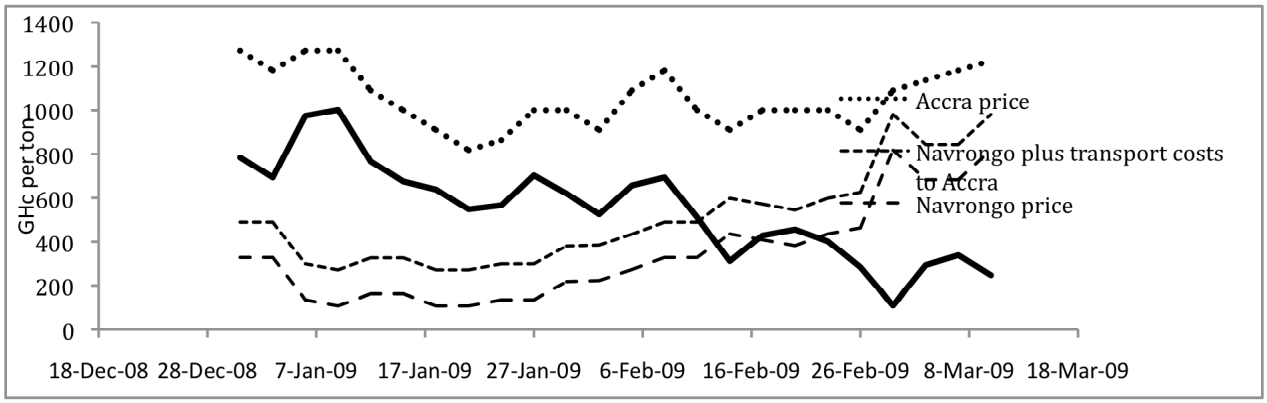
Controlling tomato flows into major markets does seem to enable traders to make additional profits during some seasons

Traders stress that the key benefit from controls is reduced risk rather than excess profits. We look in more detail at prices during the December–May season when the only supply of tomatoes from Ghana is from irrigated farms in the Upper East region, but with considerable competition from Burkina Faso which also supplies the Ghana market during these months. Our data suggest that during this season, traders bringing tomatoes to the Accra markets from other regions can make considerable profits over and above the costs of transportation.

Figure 5 compares prices in the Upper East's local Navrongo market, where access is not restricted, with prices in the main Makola market in Accra for the December 2008 to May 2009 Upper East irrigated season. The price differentials between the markets in Navrongo and Accra vary considerably between December, when tomato is typically fairly plentiful, and March, when

tomato begins to become scarce. Prices in Navrongo reflect “surplus” supply from small-scale farmers and larger farmers who cannot sell to the traders but are able to transport their own tomatoes to the local market. The quality of these tomatoes, including their transportability, however may be lower than those tomatoes entering the larger Accra market. These prices are therefore an inexact proxy for the farmgate price. This caveat notwithstanding, we explore the “rents” traders may have earned by bringing tomatoes to Accra (traders margins in excess of tomato and transport costs). From Figure 5 we see that prices in Navrongo market—which our survey suggests reflect prices paid by traders to farmers in the region—rise steadily over the season, reflecting the increasing scarcity of tomato in the system. In contrast, prices in the Accra market start high and remain high, seemingly unresponsive to the total volume of tomato in the system (though there is some correspondence). The trader net revenues (rents) fall over the season as the total availability of tomato falls and by March 2009 only just cover traders’ cash expenses. The pattern of price differentials for the 2008–2009 Upper East season is different from the 2007–2008 season with the price differential for the latter increasing then decreasing over the season. It is therefore not possible to make many generalisations from year to year, though the price spikes in the Accra market in March and December 2008 suggest that at times the Accra market is not well integrated with the other markets (refer back to Figure 4).

Figure 5. Price differentials between markets in Navrongo and Accra, 2008–2009



Source: Adapted from Ihle and Amikuzuno 2009.

Burkina tomatoes appear to have superior keeping quality and may attract higher retail prices; importing is therefore more attractive to traders than buying from the Upper East

To explore details of the margins along the value chain, we consider farmers supplying the Accra market from Ghana's Upper East and Brong Ahafo regions, and Burkina Faso. Along the value chain we focus on farmers, comparing input costs with farmgate prices; traders, relying both on discussions with traders at Makola market and our own data collection of farmgate and market prices; transporters, using data from field interviews; and retailers, using information collected from Accra's Makola market.[1]

Among Ghanaian growers those in Brong Ahafo make the highest profits

In our Three Region Survey, farmers in Brong Ahafo had the greatest profits, whilst farmers using public irrigation in the northeast had the lowest profits (Table 2).

Table 2. Farmer profits by region (excluding own labor costs)

	Cost per ton (GH¢)	Profit per ton (GH¢)*
Greater Accra-Rainfed	200	116
Greater Accra-Irrigated	202	118
Brong Ahafo	96	345
Upper East-Public Irrigation	227	-49
Upper East-Private Irrigation	104	110

*To determine farmer profits, we took their average price for the season as 0.67 times the lowest selling price plus 0.33 times the highest selling price.

Source: Three-Region Survey 2009.

Transporters make similar margins per week whether going to Burkina Faso or Upper East

Transporters are a key player in the tomato trade. To collect tomatoes from Burkina Faso to bring to the Accra market involves a five day trip: two days to reach Burkina Faso, one day to load the tomatoes, and two days to bring the tomatoes back to Accra. Frequent breakdowns cause delays.

[1] Farmer profitability varies considerably by region, and by year. The data we are using is from our Three Region Survey, conducted in 2009. However, our findings do fit with a general feeling amongst farmers and traders that tomato farming in the Upper East is particularly problematic at the moment, with farmers having little access to market traders; whereas farming in Brong Ahafo tends to be more profitable, with high demand from traders from Ghana and Cote D'Ivoire.

Table 3. Breakdown of transportation margins from farm region to Accra

	Upper East	Brong Ahafo	Burkina
Fuel	660	200	950
Maintenance (20 percent of revenue)	270	144	360
Total Costs	930	344	1310
Total Cost/kg	0.085	0.031	0.119
Revenue	1400	800	2200
Revenue per kg	0.127	0.073	0.200
Margin per truck	470	456	890
Margin per crate	4.7	4.56	8.9
Margin per kg	0.043	0.041	0.081
Margin per kg per day*	0.022	0.014	0.016

* Assumes 3, 2, and 5 days respectively per trip.

Transporters going to Burkina Faso charge approximately GH¢22 per 110kg crate and load 100 crates per truck (an additional 20 crates are loaded onto the truck but not charged as these are sold to pay the driver expenses). The transporters therefore get gross revenues of GH¢2,200 per trip. Fuel costs are estimated at GH¢950 per trip and maintenance per trip approximately GH¢360 per trip, totalling GH¢1,310 per trip. Net revenues (not taking into account depreciation of the truck) therefore come to GH¢890 per trip, approximately GH¢180 per day for a five day working week.

Quality-related price differentials are key to making imports more attractive to traders

Not surprisingly, traders' costs are greatest when bringing tomato from more distant Burkina Faso where border costs are also incurred than less distant Upper East and Brong Ahafo regions in Ghana (

Table 43 and Figure 6). As we have shown, trader margins vary considerably over the season in the Upper East, and such variation is likely for other seasons and regions. To determine average trader margins we use average farmgate prices (using data from our Three Region Survey for Upper East and Brong Ahafo, and from an ongoing market survey for Burkina Faso); average wholesale prices for the relevant season, based on Ihle and Amikuzuno (2009), and transportation costs as determined above. Table 4 suggests that traders make better margins from tomatoes purchased from the Upper East. Why do they then import from Burkina Faso? One possibility is that they receive premium for Burkina that are higher what we have observed. Traders have reported that tomatoes from the northeast sell at a lower price because they do

not last as long as those coming from Burkina Faso. Or they chose imports over northeast tomatoes to avoid the risk of spoilage.

Table 4. Gross profits for traders bringing tomato to Accra (GH¢ per ton)

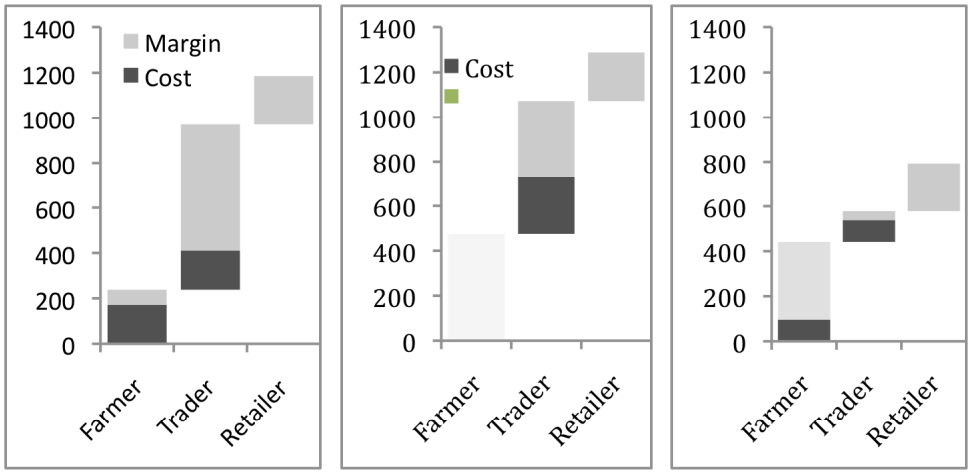
	Upper East	Brong Ahafo	Burkina Faso
Average farmgate price per ton*	238*	488	475
Transportation	139	74	185
Other (border)	0	0	41.2
Wooden crates	9.3	9.3	9.3
Loading	13.9	13.9	18.5
Total transport costs per ton	162	97	254
Average price in Makola Market during season per ton***	971	578	1073
Gross profits per ton**	571	-7.2	344

* Average price for farmers selling to traders; ** Assumes no losses, excluding trader own costs; *** Assumes premium for tomatoes from Burkina Faso
Source: Own survey 2009.

Lead boys may be instrumental in diverting trade to Burkina Faso

Determining the returns to lead boys is tricky, though there is a general feeling among traders and farmers that lead boys make considerable money from both the Ghana trade and Burkina Faso cross-border trade. Lead boys have been reported to earn CFA1000 per crate for cross border trade (equivalent to GH¢3 or US$2 per crate). Given that a truck is typically carrying 100 crates, this would amount to US$200 per border crossing per truck. There appears to have been a switch in who makes use of lead boys in the Upper East. When farmers did not have difficulties finding traders to sell to, it was the traders who paid the lead boys to identify farmers. However, with increasing competition from Burkina Faso, farmers now appear to pay the lead boys to bring traders to them. Often the contact is made by one of the farm leaders, and the payment is typically GH¢1 per crate.

Figure 6. Estimates of margins per ton for the tomato trade, 2009–2010



Upper East to Accra **Burkina Faso to Accra** **Brong Ahafo to Accra**

Source: Composite graphs using data from Ihle and Amikuzuno 2009; Three Region Survey 2009; Trader Report to IFPRI 2009; interviews.

Trading practices discourage quality differentiation in the market

Poorly developed value chains for agricultural produce are often characterised by little differentiation by quality, little sorting and grading of the produce, and poor market signals from the consumer to the producer. Such a situation characterises Ghana's tomatoes where farmers typically fill the crates provided by the traders with whatever they have harvested that day, hiding the lower quality tomatoes at the bottom, and placing the higher quality tomatoes at the top. Crates are often loaded with different varieties of tomato that a farmer may have grown on the same field. Traders in turn try to pile the crates as high as possible, increasing damage to those tomatoes at the bottom of the crate. Because traders and farmers negotiate on the price per crate and to some extent the variety grown rather than quality, any price–quality signals that might be sent by consumers are typically not transmitted along the value chain.

Negotiations between farmers and traders, and traders and retailers are made over the average estimated quality of the crate. However, retailers sort their tomatoes according to size, firmness, and visual appeal before selling by volume to individuals, chopbars, and restaurants, and there are considerable price differentials depending on quality. In Makola market in Accra in January 2010, we observed individual retailers offering several qualities of tomatoes and typically 4–5 different volume containers. Higher quality tomatoes are large, firm, and visually pleasing with no external blemishes and attract the highest price. Smaller tomatoes are sold at a lower price. Still lower quality tomatoes that are split, squashed, or slightly mouldy are cheaper and typically sold to chopbars who will cook them immediately. Once the quality deteriorates even more, the tomatoes are often left to rot, then washed, and the seeds extracted and sold.

Because informal grading and sorting occurs only for transactions between the retailer and consumer, but not for transactions between the trader and retailer or the farmer and trader, there is little scope for quality signals to be transmitted between the consumer and farmer. In Tanzania and Kenya, grading and sorting tomatoes is common (Koenig et al. 2008). Intermediaries/traders grade produce on the farm, taking the top grades and leaving the lower grades for farmers to sell at local markets or directly to retailers at the farmgate. Typically the group that undertakes sorting and grading is able to maximize profits by capturing the premium for quality (Zijp). On-farm grading, sorting, and even packaging has been shown to improve farmers' income in Burkina Faso for cotton production and in Turkey and Tunisia for flower production (Zijp). Moreover, sorting and grading tomatoes immediately after harvest has been found to improve overall quality (Prigojin et al. 2005). In the 1990s, when farmers were more likely to bring their produce to the Kumasi market, farmers would bargain individually with retailers, with the mediation of commissioning agents. The quality of tomatoes in Kumasi market where farmers did their own grading, was found to be higher than in Accra where price was set centrally at the beginning of each day (Orchard and Suglo 1999).

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