

SIGNIFICANCE OF ACTORS IN THE MAIZE SUPPLY CHAIN FOR SENIOR HIGH SCHOOLS IN KUMASI

Andrews Osei Mensah¹, James Peprah¹ and Kwabena Nduro²

¹Takoradi Polytechnic, School of Business

²Takoradi Polytechnic, School of Applied Arts.

ABSTRACT: *The study seeks to address the supply chain of maize specifically to Senior High Schools in Kumasi Metropolis, Ghana, looking at the actors involved in the supply chain, their inter-relationships as well as the kind of network that connect them. Knowledge of these objectives will help any prospective merchant or any other stakeholder to be guided by what is in store for them and its effect. Questionnaire was used to gather data from sixty-eight respondents. The results indicated that there are some actors in maize supply chain who serve as the link between the main actors like the merchants and the consumers. Little assistance the actors give to one another includes discount and little financial support. There must be trust and fairness as well as availability of loan facilities, collaboration and prompt payment of debt that will help to improve the network among the actors.*

KEYWORDS: Supply Chain Network, Actors, Relationship, Maize, Kumasi, Senior High Schools

INTRODUCTION

In a milieu marked by ever-greater global competition, maize sector organisations have been seriously probing the configuration of their entire maize supply chain (MSC). Maize (*Zea mays*) belongs to the family Gramineae, sub-family Panicoideae and the tribe Andropogoneae (Norman et al., 1995). Maize is the third most important cereal crop after wheat and rice in terms of production in the world (IITA, 2009). It is the most important cereal in terms of production and consumption (Breisinger et al., 2008). Also organized maize improvement in Ghana started in the 1930's (GGDP, 1984; Sallah, 1986). Maize is produced in large quantities in some farming centres in Ghana such as Ejura, Sekyere-Dumasi, Abofo in Ashanti Region, Takyiman and Nkoranza in Brong Ahafo Region, Northern Regions just to state a few. Maize accounts for 15-20% of the daily calories in the diets of many people throughout the world especially the developing countries (Dowswell et al., 1996). It is a staple food which is consumed in every household, tribe, town, village or city in Ghana and Africa as a whole. Together with rice and wheat, maize provides at least 30 percent of the food calories to more than 4.5 billion people in 94 developing countries (von Braun et al., 2010).

Institutions such as Senior High Schools (SHSs) in Ghana are not exceptional when it comes to the consumption of maize. The boarding students of these institutions consume maize more than any other single food in Ghana. For instance, nine (9) out of 21 meals served to the boarding students of T.I. Ahmadiyya Senior High School throughout the week were made up of maize during 2013/14 academic year. According to ICEF Monitor (2014) the vast majority of Ghanaian students attend public boarding schools. This means that a very large quantity of maize is demanded by these schools to feed these boarding students. Shortage of maize in

Ghana will be very serious issue looking at the rate in which it is being consumed and in the same way the inability of the actors within the supply chain (SC) of maize to make the movement or the transportation of the maize as swift as possible to the final consumer creates another problem in terms of high cost, customer not satisfy among others. The traditional notion that organisations are entities that exist independently from others and needs to compete with each other to survive (Christopher, 2005) is self-defeating in this highly competitive world. The involvement of organisations in a network through upstream and downstream linkages in different processes and activities produces value in the form of products and services in the hands of the final or ultimate consumer (ibid). Actors or organisations or individuals within the SC are very key in making this value achieved.

There are lots of scholarly works written on maize, SC and value chain analysis. Kumar et. al., (2012) for instance, wrote on value chain analysis of maize seed delivery system in public and private sectors in Bihar-India focusing mainly on private seed companies and public research institutions. Their study centred on the understanding of the delivery system of maize seed in a value chain perspective as well as dissemination of maize seed and the seed value chains in Eastern India. Again there was a report by USAID (2010) on staple foods value chain analysis in Kenya covered eleven staple crops (Maize, Wheat, Rice, Sorghum, Millet, Beans, Pigeonpeas, Cowpeas, Chickpeas, Cassava and Groundnuts). The study was conducted for a market assessment of these staple foods in Kenya. Kaminski, Elbehri and Zoma (2013) also wrote on an analysis of maize value chain and competitiveness in Burkina Faso on the implications for smallholder-inclusive policies and initiatives for competitive and inclusive maize value chain. The study concentration was on the value of maize to both rural and urban centres and consumption of quality maize. It again did not tackle the significance of the actors in the maize value or SC though there was some mention of actors like the wholesaler, retailer and farmers.

Besides, study in MSC has become aware of the importance of the social network analysis in the last years, and many studies are being conducted in this interdisciplinary, as: Galaskiewicz (2011), Borgatti and Li (2009), Choi and Kim (2008), Carter et al. (2007), Lazzarini et al. (2001) among others. This is because the chain term is considered an imperfect metaphor for dealing with SC relationships since it rarely has a linear behaviour (de Camargo Jr, Neto, Pires, da Silva, Correa 2012). Supply chains here understandably are indeed networks and not just an aggregation of supplier and customer relationships (Borgatti & Li, 2009; Brookes & Singh, 2008; Carter et.al., 2007; Choi & Kim, 2008; Galaskiewicz, 2011). The idea in the SC sees the actors as being interdependent rather than independent and relational ties between them could be used to represent transfer or flow of resources (de Camargo Jr, et. al., 2012). This shows the fact that the structure of the SC where the actors are positioned, could bring benefits, constrains or challenges to all other companies. This scheme represents the concept of embeddedness, that highlights the fact that an actor's decisions and outcomes are affected not only by its actions and relations, but by the structure of the overall network of relations within which the actor is inside (Granovetter, 1985; Uzzi, 1997). It is in this direction that this study wishes to explore the significance of actors in the MSC for second cycle institutions in Ghana particularly Kumasi. There is very few (even if they exist) study conducted in Ghana on MSC specifically looking at the significance of actors within the chain.

Problem Statement

It is very important for the schools to get continuous supply of food especially those they consume on large quantities like maize, throughout the academic year. Absence of having enough supply of maize may not depend on its scarcity only, but other reasons such as poor SC may also affect the availability of maize. Some of these actors in the chain may not be identified and recognised in most SCs yet their roles are so much significant to this SC. Their roles may facilitate the availability of maize from one place to another especially from the farming communities to other places to the consumers. Those actors (players) involve in getting the needed quantity of maize are important as well as the type of SC that the maize will pass through to the schools also needs to be established. To get continuous supply of maize at both bumper and lean seasons, the actors, the network and anything that can have effect on the flow movement of maize to the schools must be identified.

Moreover, in the present day, businesses do not compete with each other individually on the market, but as members of a SC, delivering the goods or service to their consumers in joint collaboration (Noémi, 2012). Participants cooperate in the process of purchasing, production and selling; their mutual interest is to satisfy consumer demand, as a result all the basic material and parts producers, product assemblers, processing units, wholesalers and retailers are part of a chain, if they collaborate in and coordinate these processes (ibid). However, very few studies on perspectives of actors' significance in MSC have been examined in any depth. Jraisat (2011) mentioned that conceptually the management of SCs is not particularly fully understood, and many authors have highlighted the necessity of clear concepts and conceptual frameworks on supply chain management (SCM) (e.g. Harland, 1996; Wilson, 1996; Croom et al., 2000; Svensson, 2002; Williamson, 2008). Most of the discussions were about supply chain relationships, information and product flow, networks and transactions (Anderson et al., 1994; Ritter 1999; Toften & Olsen, 2003; Parker et al., 2006; Hsu et al., 2008) and not on the significance of the actors in the chain. Van Hoek (1998) and Ozinga & Hofstede (2005) on the other hand, underlined the role and the contribution of various actors in a chain (which could differ), is of immense substance in the chain and needs to be investigated. Chan (2003) also stressed on how consumers must be the ultimate focal point of any performance measures and highlights the inter-linkage between the chain and consumers.

It is clear that there has been lack of empirical research on the significance of actors in MSC and it does limit the understanding of the significance of actors in MSC to promote business relationship. Thus, this paper in general attempts to add to literature on MSC by specifically presenting a review of the actors within the MSC, identify the network within the MSC of SHSs and examine the assistance the actors get among themselves.

LITERATURE REVIEW

Supply chain

Supply chain encompasses all activities associated with the flow and transportation of goods from the raw materials stage (inbound logistics), through to the end user (outbound logistics), as well as the associated information flow (Finch, 2006). He continues to state that SC is the path of value creation, from basic producer to consumer, including all transportation and logistics services that connect them. From the above definition, Finch emphasised that, in

every SC those actors involve are very important to make that SC a reality. An SC can counter the risks in an effective manner when all the partners in that chain trust each other and frequently share information which is facilitated by collaborative relationships among the SC members (Faisal, Banwet and Shankar, 2006). A single SC is a set of three or more entities (organisations or individuals) directly involved in the upstream and the downstream flows of products, services, finances, and/or information from a source to a customer (Mentzer et al, 2001).

According to Christopher (2005), SCM is defined as “the management of upstream and downstream relationships with suppliers and customers, to deliver superior customer value at less cost to the SC as a whole”. Similarly, SCM is the oversight of materials, information, and finances as they move in a process from supplier to manufacturer to wholesaler to retailer to consumer (Naing, 2008). Supply chain management takes into account the design of physical material flow processes, and looks in-depth at the entire system and organisation of material, information and financial flows (ibid). This implies that SCM involves the flow of materials, information as well as finance. In a simple term, SCM can be divided into three main flows: the product flow, the information flow and the financial flow as shown in Figure 1. The product flow includes the movement of goods from a supplier through to a consumer as shown in the direction of the arrow while financial flow and return of goods and service flow in reverse direction. The information flow involves transmitting orders and updating the status of delivery. The financial flow consists of credit terms, payment schedules, and consignment and title ownership arrangements (Naing, 2008).

Supplier —————> Manufacturer —————> Wholesaler —————> Retailer —————> Consumer

Key: —————> *Flow of goods and services and Information*

Source: Naing, (2008)

Figure 1: A Simple Supply Chain Model

Actors within the maize supply chain

Kumara, Alama, Krishnab and Srinivasa (2012) on value chain analysis of maize seed delivery system in public and private sector, surveys of seed producers, farmers, seed distributors, private seed companies and public research institutions in relation to the delivery system of maize seed in a value chain perspective, mapped the value chain of public and private seed systems and has brought out the need for a greater emphasis on integration of different stakeholders involved in the chain. Shepherd (2007) on approaches to linking producers to markets identified farmer to domestic trader; farmer to retailer; linkages through a leading farmer; linkages through cooperatives; farmer to agro processor; farmer to exporter and contract farming. Independent Consulting Group (2003) on key participants in the MSC in Uganda, pointed out, the MSC involves a number of participants that include farmers, traders, agents, millers, animal feed producers, local brew makers and consumers.

Hellin and Meijer (2006) from guidelines for value chain analysis, the chain actors who actually transact a particular product as it moves through the value chain include input (e.g.

seed suppliers), farmers, traders, processors, transporters, wholesalers, retailers and final consumers. The first step in mapping the market is to delineate the value chain. The flow of seed to farmers and grain or tubers to the market occurs along chains. These can be referred to as value chains because as the product moves from chain actor to chain actor e.g. from producer to intermediary to consumer it gains value (ibid). A value chain can be defined as the full range of activities which are required to bring a product or service from conception, through the different phases of production (involving a combination of physical transformation and the input of various producer services), delivery to final customers, and final disposal after use (source).

Supply Chain Network

The implementation of SCM involves identifying the SC members with whom it is critical to link, the processes to be linked with each of these key members, and the type/level of integration that applies to each process link (Croxtton, García-Dastugue and Lambert, 2001). The SC structure is the network of members and the links between members of the SC. Business processes are the activities that produce a specific output of value to the customer. The management components are the management variables by which the business processes are integrated and managed across the SC. It is understood here that SCs are indeed networks and not just an aggregation of actors' relationships (Brookes & Singh, 2008; Galaskiewicz, 2011). The idea behind the SC focuses on interdependent rather than independent and relational ties between the actors which could be used to represent transfer or flow of resources (de Camargo Jr, et. al., 2012).

Supply chain Relationships

Recently, the key emphasis of SC relationship has shifted to the mutuality of long-term and value-adding (Streukens, van Hoesel & de Ruyter, 2011). Some Japanese buyer-supplier relationships (alliances) involve close, long-term relationships by which the buying firm gives some preferences to the supplier and the supplier also invests into the buying firm's machinery and that machinery cannot be used to produce other customers' products (Nakamura, 1992). Again, some companies strengthen their business ties by exchanging stock and employees (Dyer and Ouchi, 1993). Msimangira & Tesha (2014) have explored the global SCM practices and the risks faced by developing countries and found that lack of integration among all the SC is a key problem.

Tactical relationship is meant to establish some basic level of trust and honest, open communication (McCutcheon and Stuart, 2000) while van Hoek, (2000) believes that transactional relationship does not involve any formalised relationship and each transaction is made independently at arm's length. In strategic alliance, Sahay (2003) stated, it is a long-term trusting relationship which involves sharing of commitment and deals with strategic issues. In business alliance, there is greater mutual dependence with specialised processes, products and services (Murray, Kotabe, & Zhou, 2005).

Assistance within supply chain

Actors in every SC are expected to coordinate with each other especially in sharing information. Lee, (2000) stated that the coordination of information sharing helps to realise the coherency of information, while SC actors cooperate with one another and follow rules of diffusing information across borders (ibid). According to Cadilhon, et al (2006), since high

product quality is required from the producers (farmers), they are provided with technical assistance in terms of good agricultural practices, aside from providing the seeds. Again the farmers are provided with assistance in terms of agronomic support, production advice and, in some instances, finance agricultural inputs (ibid).

From Batt et al (2007), some stakeholders worked with government extension officers to communicate their quality specifications and technologies for improving yield and quality to farmers. The farmers were given assistance and payment in cash paid off. It is evident that actors in SC need to share information and get assistance from other actors or stakeholders such as the government or other organisations (ibid). The writes have emphasised the need for actors in any SC to assist each other mutual benefits such as information sharing.

Actors in Supply Chain

Simatupang, Wright & Sridharan, (2002) stated that the tasks of different players are completed in a manner consistent with the mutual goal, because SC performance depends on how well all members work together and not on how well each member performs separately. Nagurney, Cruz and Matsypura, (2003) developed a network equilibrium model for an SC comprised of three tiers-manufacturer, retailer, and consumer. The model uses a variation inequality formulation to derive product transportation and price patterns in the network, assuming cooperation between tiers but competition within tiers. Organisational linkages consist of interconnected actors who perceive and argue about their own interests in carrying out collective action (Simatupang, Wright and Sridharan, 2002).

Maize in Ghana

Maize is the most important cereal crop produced and most widely consumed staple food in Ghana with increasing production since 1965 (Morris, Tripp and Dankyi, 1999). Maize production occurs in all the ten administrative regions in Ghana but more than 70% of maize comes from five regions which are Northern, Brong-Ahafo, Ashanti, Central and Eastern Regions (Amanor-Boadu, 2012). Meanwhile, storage is sufficient in total capacity in the north, supply near market hubs is scarce and therefore rents are at a premium (Gage et al, 2012). Maize farmers are inherently risk-averse and unlikely to produce more consistently if the market demonstrates uncertainty (ibid).

METHODOLOGY

There are 22 senior high schools in Kumasi Metropolis and the researchers selected 10 schools representing 45% using purposive sampling technique. These schools are T.I. Ahmadiyya Senior High School, Prempeh College, Yaa Asantewaa Girls' Senior High School, Kumasi Senior High School, Asanteman Senior High School, Seventh Day Adventist Senior High School and Kumasi Anglican Senior High School. The rest are Serwaa Nyarko Senior High School, Kumasi Secondary Technical Senior High School and Technology Senior High School. These schools were selected through purposive sampling method. Kumasi Senior High and Prempeh College are the only boys' schools while Yaa Asantewaa and Serwaa Nyarko are also the only girls' schools. The rest are all mixed schools. Each school was represented by either its bursar or procurement officer as the respondent for the study. The corresponding major suppliers to the schools were also identified and included in the study. According to Denzin and Lincoln (2000), sociometric (snowballing) sampling

technique is generally used where members of the group identify their friends who in turn know their friends and colleagues, until the informal relationships converge into some type of a definite social pattern. With the effect of snowballing method, 10 merchants, eight (8) loading boys, 10 transporters, 12 agents and 18 farmers were included in the population. In all, the sample size for the study was 68.

This study is quantitative in nature where the main tool for data collection was questionnaire. The process of upstream flow of product for the MSC was adopted as stated by Naing (2008); (where the starting point for the study begun from the consumers who were already known, through to the farmers). The schools (for that matter the consumers) identified their suppliers (merchants) and the chain was traced up to the last actors using snowballing technique. A network map was drawn to help make it possible to “define” the actors within the MSC and also enabled the identification of the key actors who play responsible roles in various processes within the MSC.

The responses were coded using constant comparative analysis, whereby key incidents were identified and assigned to an emergent open coding scheme (Goulding, 2002). As new incidents were uncovered from the data, this coding scheme was subjected to continual re-evaluation and re-interpretation, until all the options (responses) were eventually coded. Statistical package for social sciences (SPSS) for windows version 20 was used to run the coded responses for proper analysis and discussion.

RESULTS AND DISCUSSIONS

The sample size of the respondents in the MSC

Information obtained from the respondents was discussed after the data were coded and run using SPSS. The results of the data obtained from the 68 respondents were analysed based on the researchers’ assessment and judgement. The results on the number of questionnaires received from the respondents are shown in Table 1. All the 68 questionnaire items were answered and received from the respondents representing a 100% response rate. This included 18 farmers, 10 merchants, 12 agents, 10 transporters, 10 consumers (schools) and 8 loading boys.

For the purpose of this study, the roles the various actors play have been classified to depict their names as follows: “farmers” represents “producers”, “merchants” represents “suppliers” or “wholesalers” and “transporters” could also mean the same “transporters” or “distributors”. Already the schools played the role of “consumers”. It was very difficult to compare specific roles that actors like “agents” and “loading boys” in this study play to those roles already known in typical roles such as those in Figure 1 by Naing (2008). The researchers prefer to maintain roles such as “farmers”, “merchants”, “consumers”, “transporters”, “loading boys” and “agents” for the discussions.

Table 1: Distribution of respondents

	Respondents (Role)	Frequency	Valid Percent
Valid	Farmers	18	26.5
	Merchants	10	14.7
	Consumers	10	14.7
	Transporters	10	14.7
	Agents	12	17.6
	Loading boys	8	11.8
	Total	68	100

Source: Field Survey (2014)

What is the duration of relationship of actors with major supplier?

From Table 2, all the merchants indicated that they have relationship with their major suppliers over 5 years. The consumers, the transporters, the loading boys and the agents have related to their major suppliers from 1-5 years with few of them over 5 years. In all, 13.20% of the respondents have related with their suppliers less than one (1) year, 16.2% have related with their suppliers from 1-2 years, 23.5% have 3-5 years while 20.6% have relationships with their major suppliers >5 years. The farmers do not have suppliers. This shows that the relationships between merchants and their suppliers are able to last for a longer period more than other relationships within the MSC. Again, few consumers and agents are able to keep relationship with customers beyond 5 years. The chi-square tests in Table 4 confirm significantly ($p < 0.05$) that there is a strong relationship between role and duration of the relationship with the major suppliers.

Table 2: Duration of Relationship with Major Customers

Actors	<1year	1-2year	3-5year	>5	N/A	Total
Farmers	0	0	0	0	18	18
Merchant	0	0	0	10	0	10
Consumer	0	3	5	2	0	10
Transporter	4	3	5	0	0	10
Agent	1	3	6	2	0	12
Loading Boy	4	2	2	0	0	8
	9	11	16	14	18	68
Total	13.20	16.20%	23.50%	20.60%	26.50%	100

Source: field survey 2014

Actors and their major customers

The responses show that 33.8% of the farmers selected agents and 66.2% chose merchants as their major customers. The results also indicated that the consumers (schools) have no customer as they do not supply maize to anybody in the MSC. All the transporters and all the merchants selected consumers as their major customers. Almost 75% of the agents selected merchants as their customers and 25% also selected loading boys as their major customers. It

was shown that the merchants are mostly able to supply maize to their customers through other actors such as loading boys and transporters. On the part of the loading boys, 37.5% indicated that their major customers are the merchants explaining that they only work for the merchants, while 62.5% chose transporters as their major customers as they mostly load maize for the transporters. The results suggest that the network connection among the actors might not be as simple and straight forward as seen from Naing (2008) model in the literature review, and therefore the network among them will be considered later on.

Table 4 confirms the chi-square tests showing significantly ($p < 0.05$) that the role that actors play in MSC determines the type of customers they have. For instance, the agents will not have the consumers as their suppliers because they do not sell or give maize them but rather act on the instructions of the merchants.

How do the actors relate with their major customers?

Out of 68 respondents, 60.3% relate to their major customers purely on business (transactional), 25% relate to their major customers beyond business (cordial) while 14.7% (consumers) do not have customers. Only 40% of the merchants indicated that they relate to their major customers purely on business matters while 60% indicated they had cordial relationship with their customers. This shows that majority of the relationships among the actors is purely on business (transactional relationship).

It was found out that those who mostly have cordial relationships with the customers are the merchants, the agents or the farmers. This is probably due to the observation that most farmers would like to sell majority of their maize at the presence of the agents as witnesses, or may be, trust the agents to sell maize on their behave because the farmers normally live in the same communities with the agents and therefore the farmers may try to reduce the risk of merchants defaulting payment. In this case, the agents would serve as sureties for the merchants.

How long do the actors relate with their major customers?

From Table 3, the merchants have related with their major customers for more than 5 years. This confirms the cordial relationship (beyond business) that exists between the merchants and their customers. Only 22.2% of the farmers indicated that they have related to their customers beyond 5 years. The rest of the farmers have related to their customers with a maximum of 5 years. It seems that the transporters, the agents and the loading boys have relationship with their respective customers at different number of years and this means that they are not so much concerned in maintaining any relationship with customers but are ready to relate to any customer who will be ready to do business with them. The consumers do not have customers. The chi-square tests in Table 4 show significantly ($p < 0.05$) that the type of role that the actors play has influence on the type of relationship with the customers, duration of the relationship with their respective customers, at 5% margin of error.

Actors	<1year	1-2year	3-5year	>5	N/A	Total
Farmers	2	8	4	4	0	18
Merchant	0	0	0	10	0	10
Consumer	0	0	0	0	18	10
Transporter	5	3	2	0	0	10
Agent	1	4	4	3	0	12
Loading Boy	3	2	2	1	0	8
	11	17	12	18	10	68
Total	16.20	25.00%	17.70%	26.50%	14.70%	100

Source: field survey, September 2014

It can be analysed that merchants have served their customers for a longer years. Table 5 shows ANOVAs of the role of the actors against the various variables discussed earlier on. The values confirm the significant ($p < 0.05$) values of 0.000 to 0.004, which implies that the roles of actors have strong influence on the type of supplier, customer, relationship and the number of years that the relationship or network have existed.

Table 4: Summary of Chi-Square tests

Factor	Pearson Chi Square Value	Asymp. Sig.(2-Sided)
Chi-Square Tests for Role in Relationship to Major Suppliers		
Major supplier	71.677	.000
Kind of supplier relationship	44.457	.000
Number of years with supplier	45.280	.001
Chi Square Tests for Role in Relation to Major Customers		
Major customer	70.420	.000
Kind of customer relationship	39.596	.001
Length of customer relation ship	46.469	.001
Chi Square Test For Assistance		
Who gets assistance	48.979	.000
Kind of assistance received	45.986	.001
Kind of assistance actors receive	76.416	.000
Who gives assistance	76.416	.000

Source: Field Survey, (2014)

Table 5: ANOVAs of Role against Customers, Suppliers and their relationships

Factor	Factor	Sig.
Major supplier of maize	20.303	.000
Kind of relationship with major supplier	57.128	.000
Duration worked with major supplier	18.662	.000
Major customers	6.766	.000
Duration worked with major customers	4.558	.004
Kind of relationship with your major customers	11.638	.000

Source: Field Survey, (2014)

What kind of assistance do the actors receive from each other within the MSC?

Out of 68 respondents, only 8.8%, who are farmers, get some sort of farm inputs from the merchants and only 2.9% get soft loans from other actors. All the consumers (14.7%) indicated that they get subvention from the government and not from any other actors while 11.8%, comprising agents and loading boys indicated that they get some gift from the merchants as illustrated in Figure 2. The gifts are mostly clothing, food, and other materials and not necessarily financial assistance.

In all, only 30.9% of the respondents get some small assistance from other actors within the MSC, 14.7% get some assistance from the government while 54.4% do not get any form of assistance at all. This assistance is woefully inadequate and cannot support the course of the recipients. From the chi-square tests illustrated in the Tables 4, it is significant ($p < 0.05$) that the roles the actors play affect the sort of assistance they get and from whom it comes from. This might be different from what Lee, (2000) stated in literature review that, SC actors cooperate with one another and follow rules of diffusing information across borders.

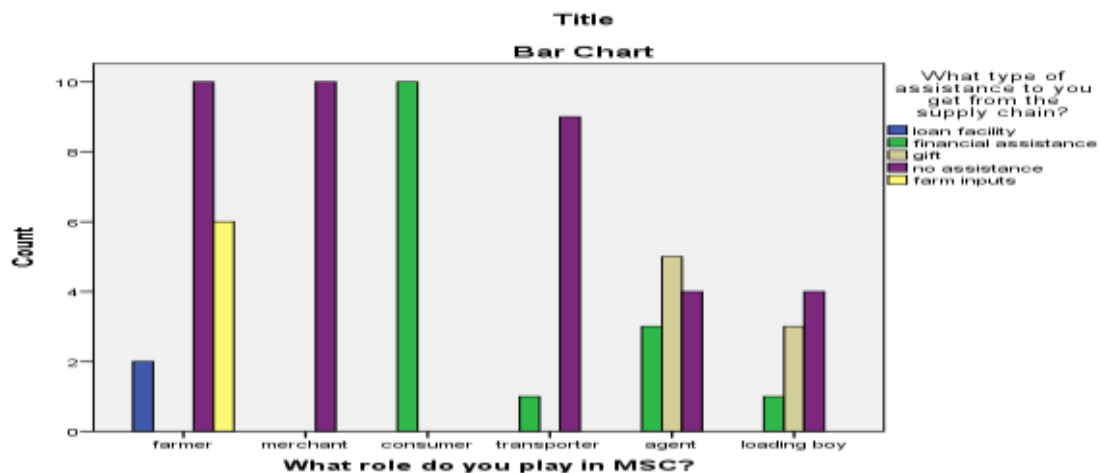
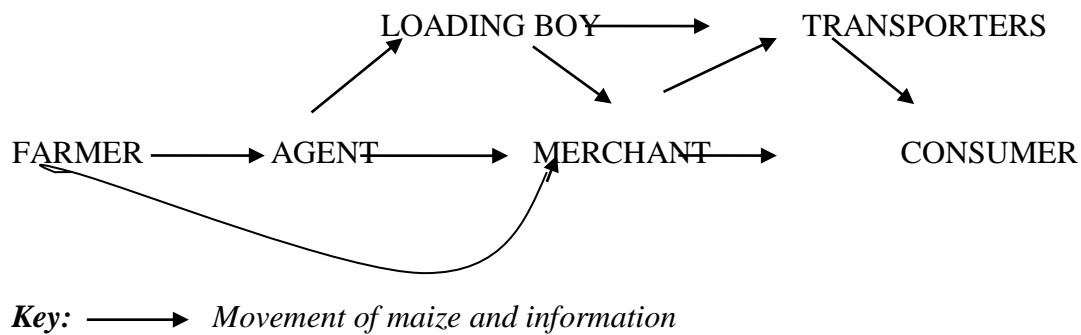


Figure 2: Bar Chart of role with respect to the kind of assistance receive

Source: Field Survey (2014)

Network of actors within the MSC involving SHS

It was found out that the kind of network for MSC begins from the farmers who after cultivating and harvesting the maize proceeds either sell it directly to the merchants or let the agents sell on their **behave**. The agents normally give the maize to the loading boys who intend load it into the trucks of the appropriate transporters to be transported to the consumer at the instruction of the merchants, or the agents hand over the maize to the merchants. If the merchants take the maize either from the farmers themselves or from the agents, they also hand over to the transporters to be transported to the consumers. It must be noted that the loading always load the maize into the truck as illustrated in Figure 3. This network within MSC is different from SC as modelled by Naing, (2008) in Figure 1 which involves supplier, manufacturer, wholesaler, retailer and consumer.



Source: Field Survey (2014)

Figure 3: MSC network diagram involving SHS

How can the network be improved?

When the actors were asked to indicate how the network chain involving the actors can be improved, Table 6 summarises the responses. Out of 23 respondents who think that the availability of loan facilities will help to improve network of the actors, it included all the 18 farmers, signifying that farmers need loan facilities to help them in their farming activities. From Table 4, the respondents believe that there are a lot of issues that will help improve network among the actors in MSC involving SHS such as fairness, loan facilities, prompt payment of debt, trust and collaboration among the actors. This goes to support Faisal, Banwet, and Shankar (2006) assertion that, an SC can counter the risks in an effective manner when all the partners in that chain trust each other and frequently share information which is facilitated by collaborative relationships among the SC members.

Table 6: What should be done to improve the network of the MSC?

	Frequency	Percent	Valid %	Cumulative %
Valid There must be trust	18	26.5	26.5	26.5
There must be collaboration	7	10.3	10.3	36.8
There must be loan facilities	23	33.8	33.8	70.6
There must be prompt payment	10	14.7	14.7	85.3
There must be fairness	10	14.7	14.7	100
Total	68	100	100	

Source: Field Survey, (2014)

CONCLUSION

Actors and Network of MSC

The study revealed that the actors of MSC involving SHSs include farmers, agents, loading boys, merchants, transporters and consumers. Most of these merchants had been supplying maize to SHSs in Kumasi for a very long time. Actors such as loading boys and agents help

to make the MSC efficient. These actors are special since they serve as the middlemen among the merchants, the transporters and the maize farmers and it would be very difficult to get the right quantity, the right quality and the right supplier of maize without them. Transporters are the other actors who were also found to play an important role in this MSC who perform the transportation function.

Relation with the other actors within the MSC

The relationships between merchants and their suppliers and their customers are able to last for longer years more than other relationships within the MSC. It was found out that most actors have related to other actors in a “purely business” (i.e. transactional relationship) manner while few of them have related to other actors beyond business (i.e. cordial relationship) and show concern of activities of others. Majority of the actors have related to others for not more 5 years. The transporters, the agents and the loading boys have relationships with other actors not more than 5 years. They might not be so much concerned about maintaining any relationship, rather, may relate to any actor who will be ready to do business with them.

Assistance among the actors

The schools, as government institutions, get financial assistance from the government but whether the assistance come at the required time or not is something that needs further investigation. All the agents also get gifts from their customers who are merchants. Only few farmers get some small financial support from other actors and external bodies. With the supply of farm inputs, again only a handful of the farmers get some from the merchants. Few actors get some discount and credit facilities from other actors since they relate to each other on purely business manner. The assistance that the actors received among themselves and elsewhere is woefully inadequate.

Network improvement

The actors believe that trust, fairness, availability of loan facilities, prompt payment of debt and collaboration can help improve the relationship among the actors within the MSC for SHS. The schools can also form clusters to do consolidated procurement or partnership purchasing so that they may form very strong negotiation teams on price as well as better credit facilities due to the high quantity of maize or food items that may be involved. They may even enjoy a very high trade discount. Again, the schools being the major actors in this MSC and the main beneficiary of the maize seeds should do well to develop other actors in the chain so that a stronger network would be built. Appropriate backward and forward linkages of these actors are likely to generate better returns from maize. The actors need to know that should any actor fail, the whole SC would also fail, and its consequences would affect all of them. Therefore there must try to build on collaboration, fairness, and trustworthiness among themselves.

The identification of all actors in the MSC and how they interrelate will help any stakeholder who wants to enter into MSC business to know the actors who need to be part of the SC and how to relate to them. The kind of assistance the actors benefit from the SC is not adequate and therefore it is important that all the actors see the benefits they may get when they begin to support each other better than they are doing now. In this case, the schools can hedge the maize by giving money to farmers to serve them as loan facilities.

FURTHER RESEARCH

The study could not ascertain whether the kind of actors identified within MSC involving the SHSs also applies to any MSC which involve other stakeholders rather than the schools. Again, what varieties of maize are mostly supplied to the schools could not be found out in the study and therefore it is expected that a further study would be looked into the varieties of maize that will be appropriate for the schools. Again, it is recommended that there must be a study on the consumption of maize by these SHSs.

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